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MAINTENANCE MANUAL

VIDEO SIGNAL GENERATOR

MG311[ ]

Anritsu

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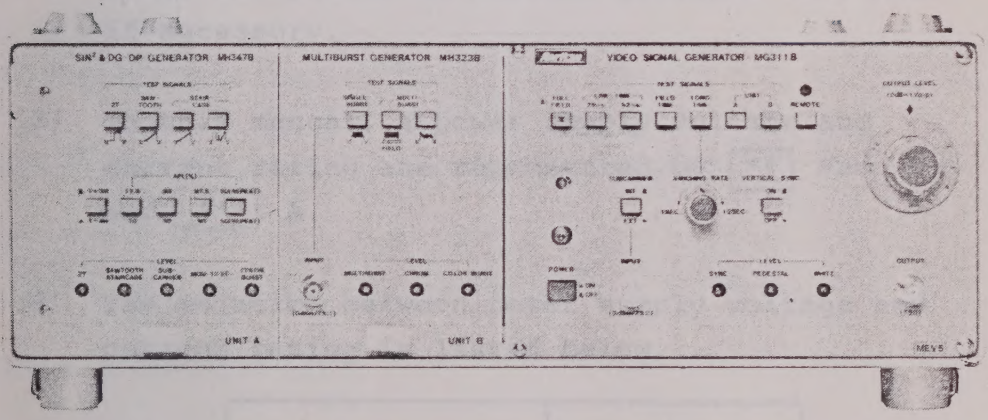
MG311[ ]



1983.07 x 30 NII-2 (Y)

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N O T E

(1) The instrument is operable on a nominal voltage from 100 to 127 Vac or from 200 to 254 Vac by changing the connections of the power transformer taps.

The voltage and current rating are indicated on the rear panel when the instrument is shipped from the factory.

In the case of other voltage operation, change the connections of the power supply transformer, and the plate of voltage and current designations on the rear panel should be changed to suitable one.
Order the plates to Anritsu Electric Co., Ltd. if necessory.

(2) In this manual, a power supply voltage and current rating are represented by [**] Vac and [***] A.

(3) The relation between power supply voltage and current rating is listed below.

** Vac	*** A
100 to 127 V	3.15 A
200 to 254 V	2 A

N O T E

(1) The instrument is operable on a nominal voltage from 100 to 127 Vac or from 208 to 234 Vac by changing the connections of the power transformer tape.

The voltage and current rating are indicated on the rear panel when the instrument is shipped from the factory.

In the case of other voltage operation, change the fuse rating of the power supply transformer, and the plate AC voltage and current designations on the rear panel should be changed to suitable one.
Order the plates to Anritsu Electric Co., Ltd. if necessary.

(2) In this manual, a power supply voltage and current rating are represented by [**] Vac and [***] A.

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** Vac	*** A
100 to 127 V	3.15 A
200 to 234 V	2 A

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SECTION I

GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains service information required to maintain the Test Signal Generator MG311[ ], including performance checks, troubleshooting techniques, adjustment, calibration procedure and repair.

1.2 PERIOD OF MAINTENANCE

This Generator is designed to permit stable performance for a long time. However, there are some cases that performance varies due to stresses and secular changes. To use the Generator under the initial performance, perform periodical maintenance and checks. When any trouble occurs, repair it referring to this maintenance manual or contact the service department, ANRITSU.

The maintenance and check schedule and their methods are shown in Table 1-1.

Table 1-1 Period of Maintenance

Symptom	Check and Maintenance Term	Service and Check
Appearance fouling	* Just before long-term storage	Wipe off with industrial gasoline.
Dust accumulation	* Operation on dusty locations * Dusty remarkably	Open the case and apply a blast of compressed air with a blower.
Knobs loose	* If any	Tighten them with specified tools.
Relay or switch contacts fouled	* Once a month	Operate the generator as scheduled according to par. 1.3.
Performance tests	* Once a five or six months	Check performance in accordance with Section II.

1.3 RELAY OR SWITCH CONTACTS

When relay and switch contacts are left unused for a long time, those will be oxidized and some trouble will occur. To clean them up, change over switches by turning on the power switch to operate the Generator approx. once a month.

1.4 RECOMMENDED TEST EQUIPMENT FOR MAINTENANCE

Test equipments and accessories required to maintain the Test Signal Generator MG311[ ] are listed in Table 1-2.

If the equipment listed is not available, equipment that meets the minimum specification shown may be substituted.

Table 1-2 Test Equipment Required for Maintenance

Instrument	Minimum Specification	Recommended Model by ANRITSU
Oscilloscope	Freq. range DC to 30 MHz	
RF attenuator	Freq. range DC to 30 MHz	M-215C
Frequency counter	Freq. range 10 Hz to 10 MHz	MF57A
Service kit		

SECTION II

OPERATION CHECKS AND TROUBLESHOOTING

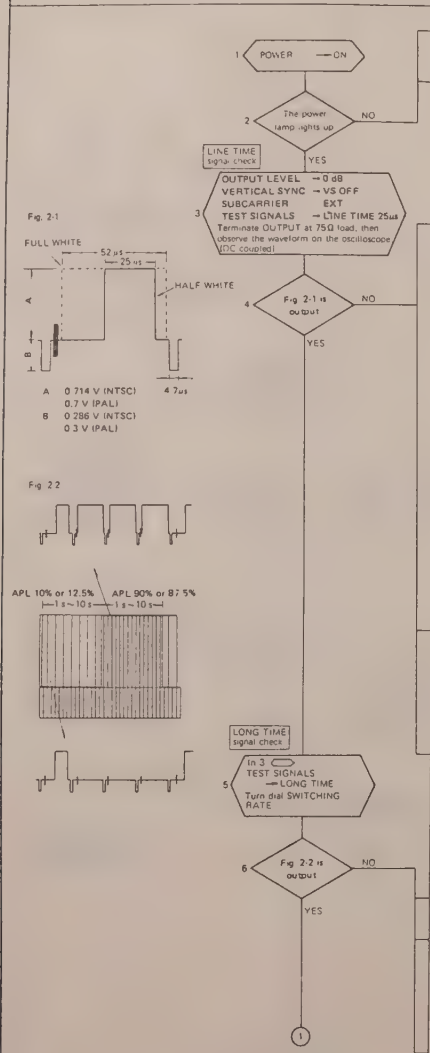
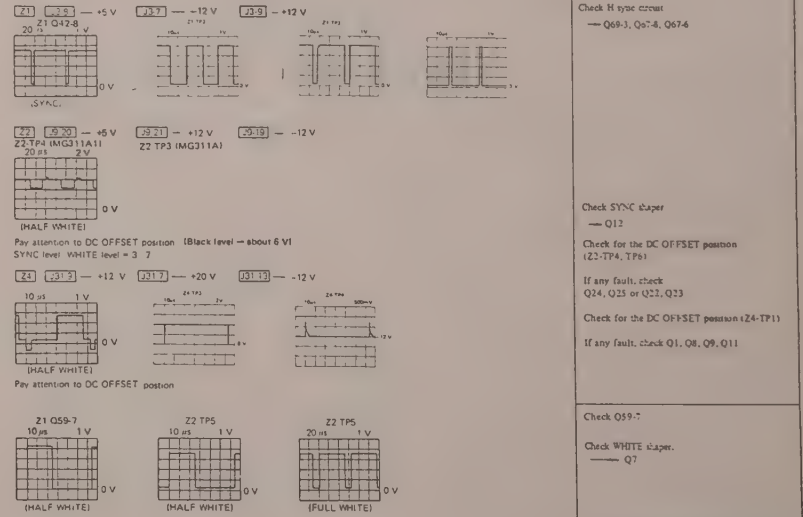
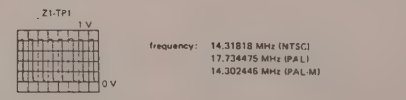
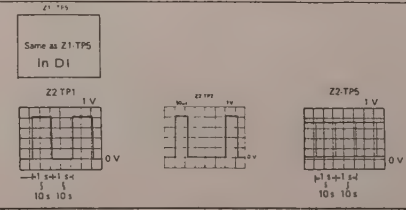
INTRODUCTION

This section explains various methods of checking if MG311[ ] meets the specifications listed in Operation Manual. These tests may be used for incoming inspection after repair of the instrument, after performing the alignment procedure, or for periodic maintenance.

If a function fails to operate, refer to Section III and IV too.

OPERATION CHECKS AND TROUBLESHOOTING

Operation Checks Flow Chart
Abnormal Symptoms
Check Points
Possible Fault Points
Fault Points
Function
Waveforms and Characteristics during Normal Operation
Diagnosis and Remedy

Operation Checks Flow Chart	Abnormal Symptoms	Check Points	Possible Fault Points		Waveforms and Caracteristics during Normal Operation	Diagnose and Remedy
			Fault Points	Function		
	1. The lamp does not light up.	Make sure whether the fuse is as rated value Make sure whether the power connector is connected to the rated voltage line	I Power cable II Lamp	Rated value: 2 A for 100 to 127 VAC 1 A for 200 to 254 VAC		Lamp fault —→ Exchange Power cable is broken down —→ Exchange
	2. The lamp does not light up due to blowing of the fuse	Make sure whether the fuse is as rated value.	A I. AC line II POWER SOURCE SECTION (Z9)	Regulator circuit		Check for a short-circuit point • Power transformer (T1) • Internal circuits of power source section (Z9) • Load side of Z9
	1. Signal SYNC is not output.	Make sure whether SYNC level adjuster is set to the correct position.	B I FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit 1 II. LEVEL ADJUSTING SECTION (Z2) Circuit 5 III. OUTPUT SECTION (Z4) Circuit 2	1. f MHz clock pulse is divided to produce a required fundamental wave, TP1 to TP4. f: 14.31818 MHz (NTSC) 17.734475 MHz (PAL) 1. Oscillator for LONG TIME 2. 4 frequency divider circuit for the APL TP2 3. Change-over circuit for signal WHITE TP5 4. Shapers and adjuster of WHITE, GRAY, PEDESTAL and SYNC. Q12 to Q15 5. T and 2T filter circuits TP3, TP4 6. Unit signal input circuit 1. Clamp circuit TP3, TP4 2. Output amplifier circuit TP1 *		Check H sync circuit —→ Q69-3, Q67-8, Q67-6 Check SYNC shaper —→ Q12 Check for the DC OFFSET position (Z2-TP4, TP6) If any fault, check Q24, Q25 or Q22, Q23 Check for the DC OFFSET position (Z4-TP1) If any fault, check Q1, Q8, Q9, Q11
	2. Signal WHITE is not output.		C I FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit BI-1 II. LEVEL ADJUSTING SECTION (Z2) Circuit BII-3 Circuit BII-5 III OUTPUT SECTION (Z4) Circuit BII-2			Check Q59-7 Check WHITE shaper. —→ Q7
	3. No waveform is output. *	Make sure whether the cable on the oscilloscope is normal.	D I. POWER SOURCE SECTION (Z9) Refer to columen AII. II. FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit BI-1 III. LEVEL ADJUSTING SECTION (Z2) Circuit BII-5 IV OUTPUT SECTION (Z4) Circuit BIII-2 Attenuator (ATT1) is broken down.			If no fault at TP1, the circuit from Z4-TP1 to connector OUTPUT is broken down.
	1. Signal SYNC is not output.		Refer to column B.			
	2. Signal WHITE is not output.	How about the symptoms in LINE TIME mode?	E I. FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit BI-1 (TP5) II. LEVEL ADJUSTING SECTION (Z2) Circuit BII-1 to 5 III OUTPUT SECTION Circuit BIII-1.	Functions of circuits (BII-1 to 5)		Check Z2-TP1, Z2-TP2, Z2-TP5.
	3 The APL is not changed		FI. LEVEL ADJUSTING SECTION (Z2) Circuit B-II-1 Circuit B-II-2	1. Oscillator for LONG TIME TP1 2. 4 frequency divider circuit for the APL TP2		

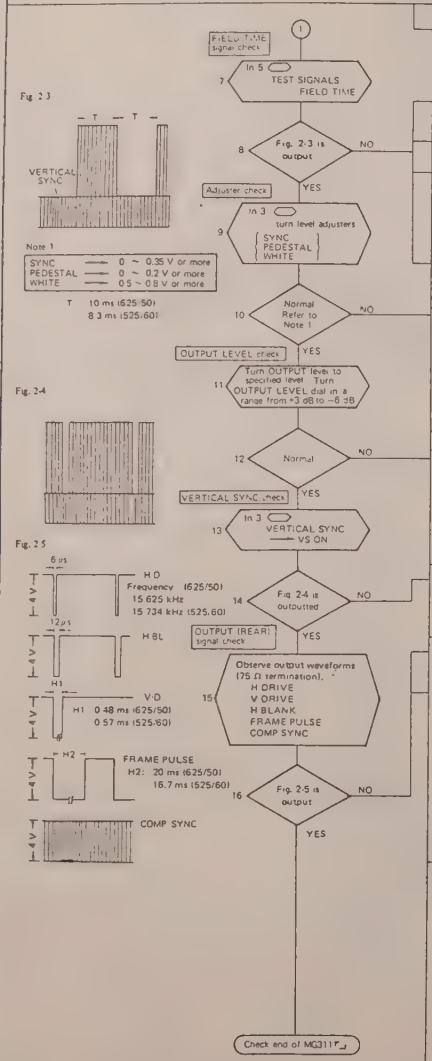
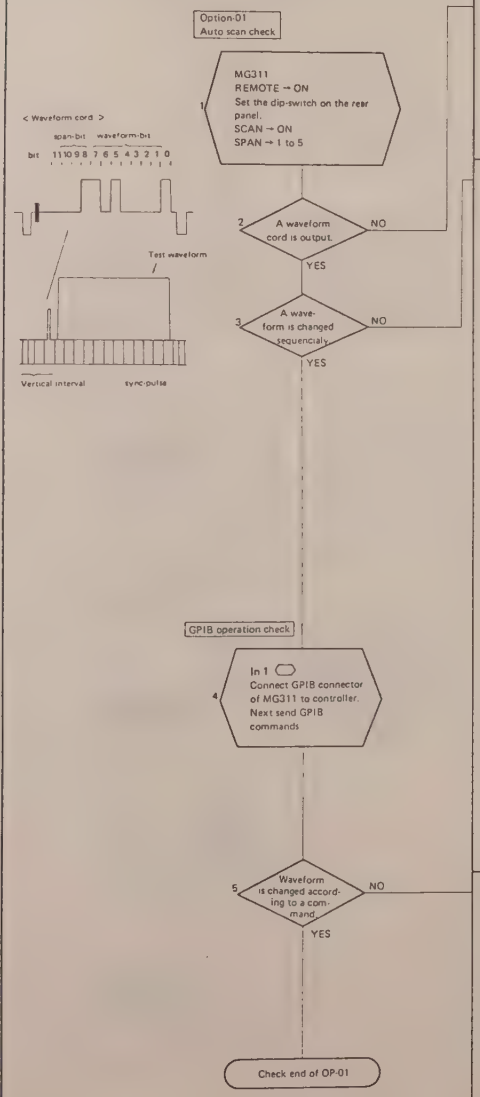
Operation Checks Flow Chart	Abnormal Symptoms	Check Points	Possible Fault Points		Waveforms and Characteristics during Normal Operation	Diagnose and Remedy
			Fault Points	Function		
	4. No waveform is outputted		Refer to Column DI to DV			A control signal used to select a waveform Check Q28-4 (0 V*)
	1. COMP SYNC is not outputted		G I. FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit B-I-1	Compsync is usually inserted in FIELD TIME signal		A control signal used to select a waveform Check Q28-7 (0 V*) Refer to colomn B
	2. Signal WHITE is not outputted at a repetition rate of 50 Hz (625/50) or 60 Hz (525 60).		H I. FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit B-I-1 (TP24)			Check Q30-12 (50 Hz or 60 Hz)
	3. Signal WHITE is not outputted		J I FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit B-I-1 II LEVEL ADJUSTING SECTION (Z2) Circuit B-I-4 Circuit B-I-5 III. OUTPUT SECTION (Z4) Circuit 8 III-1	1. Signal WHITE change-over circuit TP5.	Z2-TP5 5 ms 1 V 0 V	
	4. No waveform is outputted.		Refer to Column DI to DV.			
	1. A level can't be changed.		K I. LEVEL ADJUSTING SECTION (Z2) Circuit B-II-4			Make sure that the DC level varies with level adjuster varied SYNC — Z2-J9-5 PEDESTAL — Z2-J9-4 WHITE — Z2-J9-3 and check Q24, Q25, Q22, Q23.
	1. A level does not change as specified.	Make sure whether OUTPUT is terminated at 75 Ω load.	ATT I		Circuit to measure a step error of OUTPUT level dial MG311[ ] 0 ~ 9 dB Oscilloscope (75Ω system) (75Ω termination) dB-output level conversion dB +3 +2 +1 0 −1 −2 −3 −4 −5 −6 Output level Vp-p 1 41 1 25 1 12 1 0 89 0 79 0 71 0 63 0 56 0 5 Switch dial OUTPUT LEVEL of the MG311[ ] from +3 dB to −6 dB Also change the connected attenuator from 9 dB to 0 dB. Level of waveforms can be observed on the constant level (−6 dB)	Check circuit from Z4-TP1 to ATT I.
	1. VERTICAL SYNC is not inserted		Refer to Column GI.			
	1. Any output is not as specified level.	Make sure whether OUTPUT is terminated at 75 Ω load.			VERTICAL SYNC (525/60) 0.19ms 0.19ms 0.19ms 2.3μs 4.6μs VERTICAL SYNC (625/50) 0.16ms 0.16 ms 0.16 ms	
	2. No waveform is outputted.		L I. FUNDAMENTAL WAVE GENERATING SECTION (Z1) Circuit B-I-1 II POWER SOURCE (Z9) III. OUTPUT SECTION (Z4)	H-BLANK - Q60-7 H-DRIVE - Q58-5 COMPOSITE - Q40-4 1. Output signal shaper. Q10, Q11 The waveform of MONITOR is as same as the waveform of OUTPUT on the front panel. (0 dB)		Check the connection J115, J53, J121 and J73.

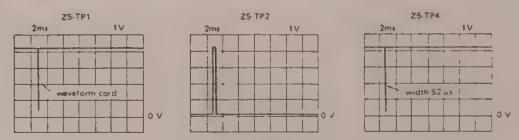
Table 2-3 Operation Checks and Troubleshooting

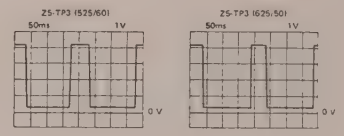


Abnormal Symptom	Check Points	Possible Fault Point: Fault Point	Possible Fault Point: Function
a. Waveform code is not inserted.		A1 WAVEFORM CONTROL SECTION (Z5)	1. Logic circuit for waveform code. TP1, TP2, TP4
b. A waveform is not changed or black burst signal is output.	• Is waveform selector set properly? – Z5-S1, 2 and 3. • SCAN → ON?	B1 WAVEFORM CONTROL SECTION (Z5)	1. CPU - Q5 2. ROM - Q1, Q2 3. RAM - Q3 4. Address decorder-Q23 5 Interuption circuit Q5-16 to Q38, TP3 6 I/O port (Memory maped I/O)
c. A waveform is not changed or black burst signal is output.	• Check the command.	C1 WAVEFORM CONTROL SECTION	1. GPIB controler IC and buffers –Q31, Q32, Q46 2. Circuit B1-1 to B1-6.

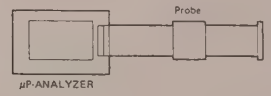
Waveforms and Characteristics during Normal Operation

25 J11-18 – +12 V J11-17 – +5 V K1-4 – +5 V' J11-16 – –12 V





< I/O port check >



Connect the probe of the μP-ANALYZER to socket of Z5-Q5 (Z80 CPU).

Memory map

Item	Circuit Reference	State RD	State WR	Address	Description
1. Program					
• ROM No. 1 2K Byte	Q1	0	–	0000H ↓ 07FFH	
• ROM No. 2 2K Byte	Q2	0	–	0800H ↓ 0FFFH	
2. Data memory					
• RAM 2K Byte	Q3	–	–	7800H ↓ 7FFFH	
3 I/O port					
• Waveform setting 1	Q18	0	–	3FFFH	Data buffers of S1, S2 and S3.
• Waveform setting 2	Q19	0	–	4000H	
• Waveform setting 3	Q20	0	–	4FFFH	
• Waveform setting 4	Q20	0	–	5000H	
• Waveform cord detector	Q10	0	–	5000H	
• Span select	Q34	0	–	3000H	
• Span code output	Q14	–	0	6000H	
• Waveform select 1	Q35	–	0	3FFFH	Data buffer and ratch for remote control. – If waveform is FIELD TIME, Q15-6 is 0 V and others are +5 V.
• Waveform select 2	Q16	–	0	4000H	
• Waveform select 3	Q17	–	0	4FFFH	
• Waveform select 4	Q15	–	0	5000H	
• GPIB address	Q33	0	–	2FFFH	
• GPIB control	Q31	–	–	2000H ↓ 200FH	

Diagnosis and Remedy

- S4 is line selector of waveform code.
  S4-8 → on?
  S4-7 → on?
- Q26 and Q30 → line counters.
- Check the connection between IC socket and IC.
- Check bus line of CPU (Q5).
  – A0 to A15 → address bus
  D0 to D7 → data bus
- Check control signal of CPU.
  – MEMRQ, RD and WR signal (Refer to circuit diagram of OP-01)
- Check interuption signal.
  → Q5-16 (5 Hz square wave)
- Check clockpulses from MG311 → Q5-6 (2 MHz).

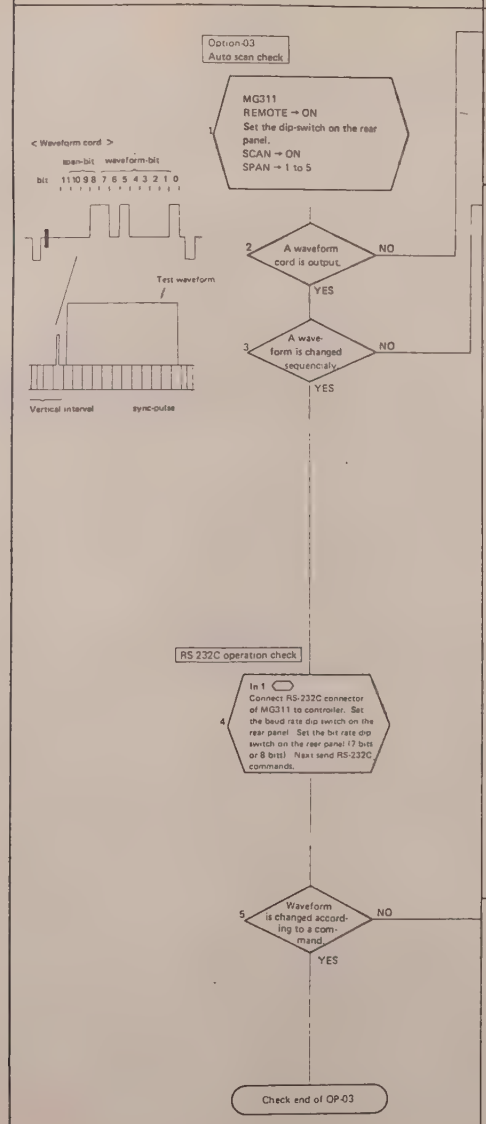
  Next check I/O port.

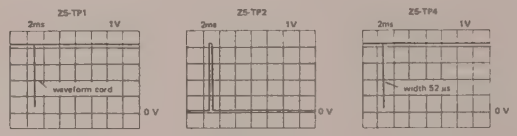
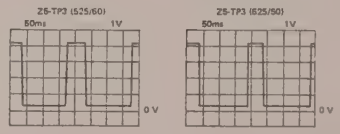
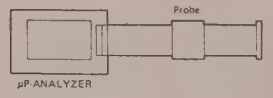
- Check the connection of GPIB cable.
- Check the dip-switch setting of GPIB address
- Check DC – level of Q38-9. → +5 V?

Table 2-4 Operation Checks and Troubleshooting

Operation Check Flow Chart	Abnormal Symptom	Check Point	Possible Fault Point		Waveform and characteristics during normal Operation	Diagnosis and Remedy
			Fault Point	Function		
ITS MODE check (Option - 02) 1 MG311 Connect the connector "PROGRAMINPUT" on the rear panel to the other signal generator. Terminate "PROGRAM OUTPUT" at 75 Ω road then observe waveforms ITS-FULL FIELD → ITS PROGRAM → ON SUBCARRIER → INT OUTPUT LEVEL → 0 dB 2 ITS is inserted (Fig. 2) NO / YES Fig. 2 ITS Recommended by CCIR (473-2) < 625/50 system > 2T MODULATED 20T LINE 17 LINE 18 2T 0.29V LINE 330 0.7Vp-p 0.14Vp-p 0.42V Chrominance LINE 331 EXT-ITS check 4 In 1 Connect the connector "EXT-ITS INPUT" to the third signal generator which is synchronized. And set internal dip-switch in Z5. (Refer to operation manual.) < 525/60 system > $\sin^2$ 2T MODULATED 12.5T 18μs 40IRE LINE FIELD 1 5 EXT-ITS is inserted NO / YES reference 3-level 3.58 MHz 50IRE 80IRE 0.714V 0.286V LINE 18 FIELD 2 Check end of Option-02	Alarm LED turn on or generator is automatic bypass mode.	• Power source. • Signal level in "PROGRAM INPUT" → More than 0.5 Vp-p	AI ITS CONTROL SECTION (Z5)	1 ITS gate pulse generator circuit. Q64 to Q78 2. Level detector and alarm circuit Q37 to Q44 3. Sync pulse detector circuit. Q1 to Q8 and Q27 to Q34 4 Line timing detector and VCO circuit. Q10, Q14 to Q23. 5 Field timing detector Q9 to Q13.	Z5 J11-18 – +12 V J11-7 – +5 V J11-6 – – 12 V Z5-TP1 10μs 1V 0 V Z5-TP2 1V 0 V H 20 ms (625/50) 16.7 ms (525/60) Z5-TP3 10μs 1V 0 V Z5-TP4 20μs 1V AC COUPLED Z5 TP5 10μs 1V Z5-TP6 20μs 1V –12 V	• Check Z5-Q64-7 and 9. If ITS timing signal (52 μs) is output, it is normal. • Check Z5-Q42-1, 14 → more than DC 3 V • Check TP5, TP6 in Z5 • Observe the waveforms in J52, J55. If there is no signal check the connection to J52 and J55. • Check the frequency in J108-14 → about 4 times of fsc. 625/50 – about 18 MHz 525/60 – about 14 MHz
			AII OUTPUT SECTION (Z4)	1. Output amplifier Q1 2. Relay circuit K1, K2, K3, K4, Q9, Q30 3 Erase circuit Q20 – eraser circuit Q38 to Q41 – eraser driver circuit. 5. Clump circuit Q8 to Q11, Q5, Q6, Q24, Q25. TP3, TP4	• Relay operation in Z4 K1 K2 K3 K4 FULL FIELD ON ON ON ON ITS PROGRAM OFF ON ON ON ITS BYPASS OFF OFF OFF ON • ITS inserted line Input signal Vertical sync	• Check the relay operation. Z4-Q9 and Q30 are relay drivers • Check waveforms on program line in Z4. → J122, Q17, Q20, Q21, Q22 and Q1.
	Subcarrier is not synchronized. → Subcarrier fase is not fixed. Subcarrier is not output.	• Signal level in "PROGRAM INPUT" → More than 0.5 Vp-p? • Is there color-burst signal in input signal?	BI SUBCARRIER GENERATING SECTION (Z3)	1. fsc VCO TP1, TP2, TP4 2. 4 Field detector (PAL system only) Q26 to TP3	Z3 J29-9 – +12 V J29 11 – +5 V J29 3 – – 12 V Z3-TP1 50μs 1V 0 V Z3-TP2 5ms 2V 0 V Z3 TP4 200mV AC COUPLED frequency: 7.16 MHz (NTSC) 8.86 MHz (PAL) Z3-TP3 20ms 1V 0 V (PAL system only)	• Check for the DC off set position (Z3-TP2 → 5 to 6 V constant) • Check waveform from Q9 to Q16. • Check the connection to J42, J111 and J69.
		• Dip switch setting.	CI ITS CONTROL SECTION (Z5) CII OUTPUT SECTION (Z4)	1. ITS gate pulse generator circuit. Q79, Q81 1. EXT-ITS insert circuit Q33 to Q37.	• EXT-ITS operation Video signal PROGRAM INPUT OUTPUT MG311 EXT-ITS INPUT 75 Ω ITS signal ITS GENERATOR IN OUT Set line selector to line No. 16.	• Check Z5-Q63-10. If ITS timing signal (52 μs) is output, it is normal. • Check EXT-ITS line in Z4. → Q33 to Q37

Table 2-5 Operation Checks and Troubleshooting



Abnormal Symptom	Check Points	Possible Fault Point: Fault Point	Possible Fault Point: Function	Waveforms and Characteristics during Normal Operation	Diagnosis and Remedy
a. Waveform code is not inserted.		A1 WAVEFORM CONTROL SECTION (Z5)	1. Logic circuit for waveform code. TP1, TP2, TP4	Z5 J11-18 – +12 V J11-17 – +5 V K1-4 – +5 V' J11-16 – –12 V 	• S4 is line selector of waveform code. S4-8 → on? S4-7 → on? • Q26 and Q30 → line counters.
b. A waveform is not changed or black burst signal is output. 	• Is waveform selector set properly? – Z5-S1, 2 and 3. • SCAN → ON?	B1 WAVEFORM CONTROL SECTION (Z5)	1. CPU - Q5 2. ROM - Q1, Q2 3. RAM - Q3 4. Address decorder-Q23 5. Interuption circuit Q5-16 to Q38, TP3 6. I/O port (Memory maped I/O)	 < I/O port check >  Connect the probe of the µP-ANALYZER to socket of Z5-Q5 (Z80 CPU).	• Check the connection between IC socket and IC. • Check bus line of CPU (Q5). – A0 to A15 → address bus D0 to D7 → data bus • Check control signal of CPU. → MENRQ, RD and WR signal (Refer to circuit diagram of OP-01) • Check interuption signal. → Q5-16 (5 Hz square wave) • Check clockpulses from MG311 → Q5-6 (2 MHz). Next check I/O port.
c. A waveform is not changed or black burst signal is output.	• Check the command. • Check the baud rate of system. • Check the bit rate of system.	C1 WAVEFORM CONTROL SECTION	1. RS-232C controller IC and buffers –Q31, Q32, Q46 Q54, Q55 2. Circuit B1-1 to H1-6. 3. Baud rate generator, –Q56		• Check the connection of RS-232C cable. • Check the dip-switch setting of Baud rate. • Check DC – level of Q38-9. → +5 V? • Check the frequency of Q56-15. e.g.: 75 baud → 1.2 kHz

Memory map

Item	Circuit Reference	State RD	State WR	Address	Description
1. Program					
• ROM No. 1 2K Byte	Q1	0	–	0000H ↓ 07FFH	
• ROM No. 2 2K Byte	Q2	0	–	0800H ↓ 0FFFH	
2. Data memory					
• RAM 2K Byte	Q3	–	–	7800H ↓ 7FFFH	
3. I/O port					
• Waveform setting 1	Q18	0	–	3FFFH	Data buffers of S1, S2 and S3.
• Waveform setting 2	Q19	0	–	4000H	
• Waveform setting 3	Q20	0	–	4FFFH	
• Waveform setting 4	Q20	0	–	5000H	
• Waveform cord detector	Q10	0	–	5000H	
• Span select	Q34	0	–	3000H	
• Span code output	Q14	–	0	6000H	
• Waveform select 1	Q35	–	0	3FFFH	Data buffer and ratch for remote control. – If waveform is FIELD TIME, Q15-6 is 0 V.
• Waveform select 2	Q16	–	0	4000H	
• Waveform select 3	Q17	–	0	4FFFH	
• Waveform select 4	Q15	–	0	5000H	
• Baud rate	Q33	0	—	2FFFH	
• RS-232C control	Q31	0	–	2000H	Data read address.
		–	0	↓ 2001H	Control word input address.
• Baud rate generator	Q56	–	0	1000H	e.g.: 75 baud → write data 01H
• Preset	Q57	0	–	6000H	Read data → 4EH

SECTION III

DISASSEMBLY

3.1 INTRODUCTION

This section explains the methods of disassembling PC boards.

3.2 REMOVAL OF MG311Γ ⌋ P.C. BOARDS

(1) Top panel ①, remove four screws ②.
(2) Bottom panel ③, remove four screws ④.
(3) Right side panel ⑤, remove four screws ⑥.
(4) Left side panel ⑦, remove four screws on a location opposite to screws ⑥.

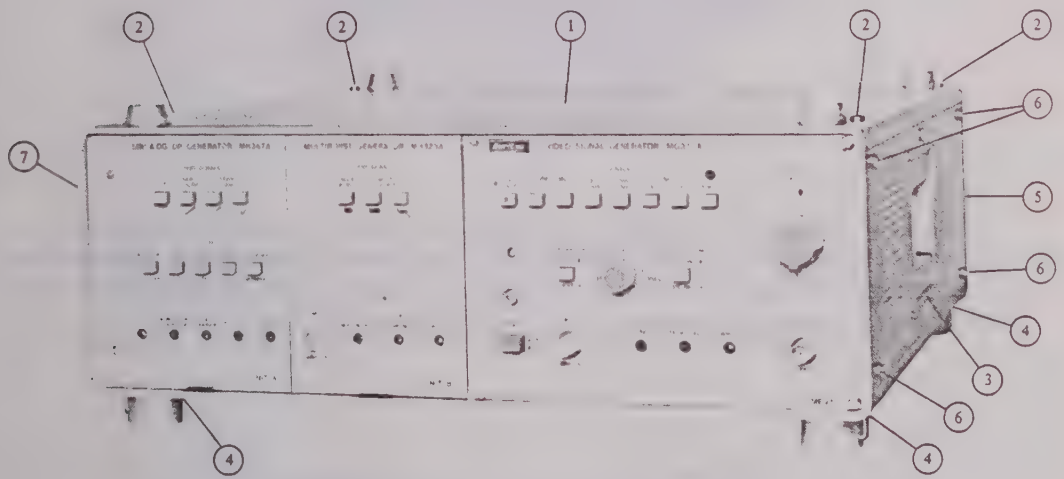


Fig. 3-1 Removal of MG311Γ⌋

When the work of step (1) is performed in Fig. 3-1, the condition of Fig. 3-2 will be formed.

(5) P.C. board Z1 , Z2 and Z5 (option), remove four screws (8) and remove bracket (9).

(6) P.C. board Z3 and Z4 , remove two screws (10) and remove bracket (11) .

* P.C. board Z10 is installed to the switch on the front panel, and can be removed along with the switch.

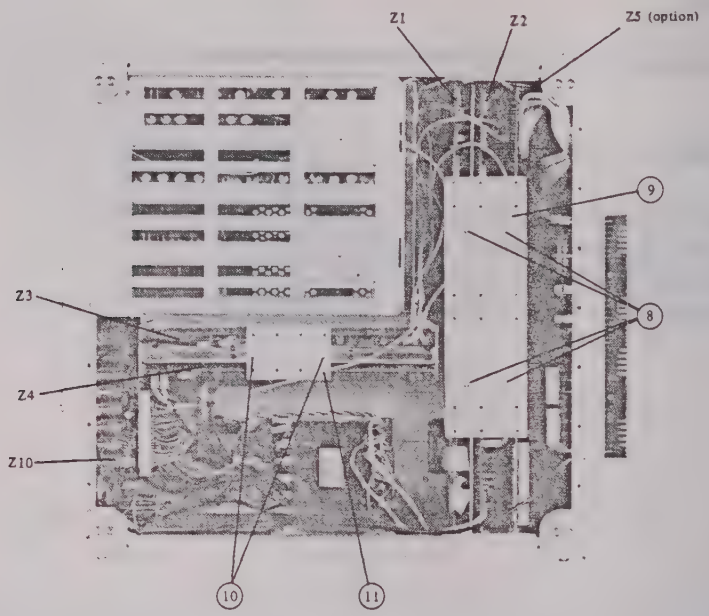


Fig. 3-2 Removal of MG311[ ]

To adjust P.C. board Z1 and Z2 and P.C. board Z3 and Z4 , proceed as follows.

(7) Perform the works of steps (5) and (6) of Fig. 3-2. Then connect the extension board for maintenance (accessory) between the PC board to Main frame connector and then adjust the PC board. (Fig. 3-3 shows the adjusting condition of P.C. board Z4 and Z5 .)

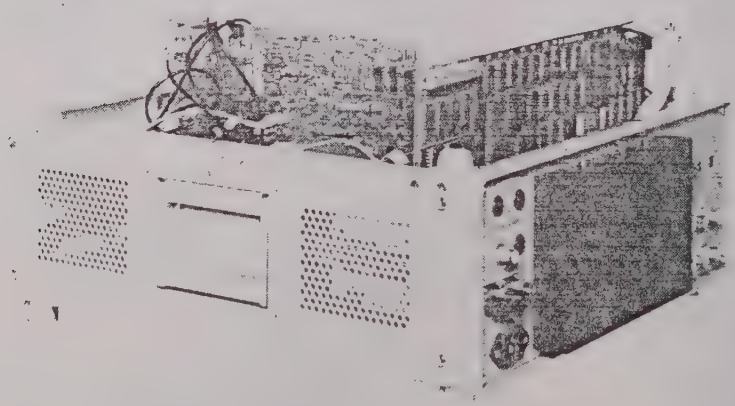


Fig. 3-3 Adjusting Condition of MG311[ ]

When the work of step (2) is performed in Fig. 3-1, the condition of Fig. 3-4 will be formed. Perform the works of steps (3) and (4) in Fig. 3-2.

(8) P.C. board Z6, disconnect connectors, remove nine screws (12) and separate the PC board from P.C. board Z8 in the direction of arrow.

(9) P.C. board Z8, disconnect connectors and remove six screws (13).

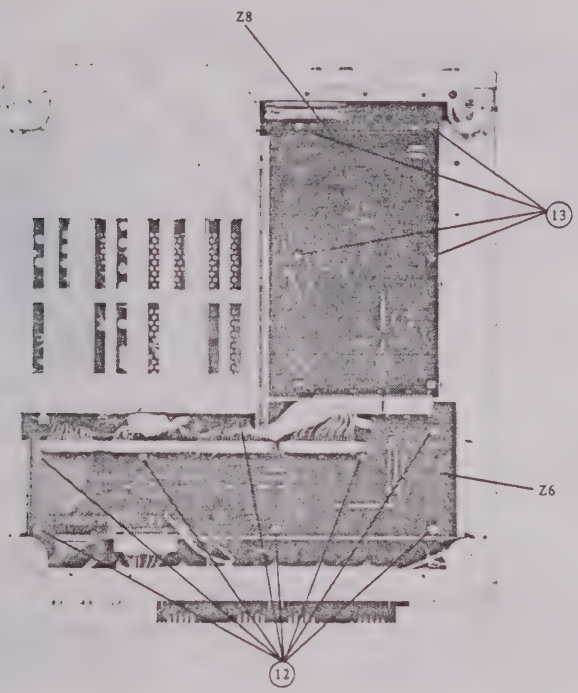


Fig. 3-4 Removal of MG311[ ]

(10) Remove four screws (14) in Fig. 3-5 and the condition of Fig. 3-6 will be formed.

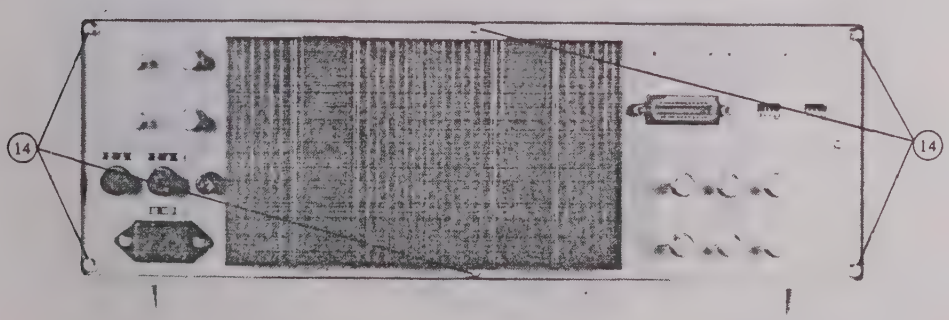


Fig. 3-5 Removal of MG311[ ]

(11) P.C. board Z9 , diconnect connectors and remove six screws (15) .

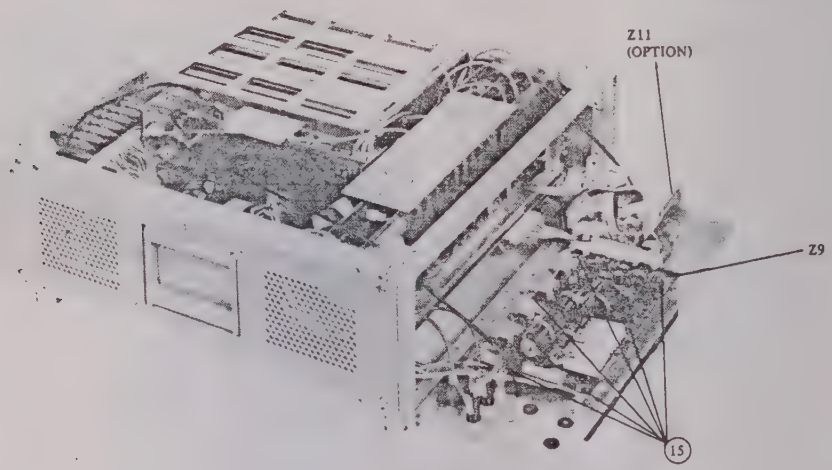


Fig. 3-6 Removal of MG311[ ]

Fig. 3-7 shows the adjusting condition of the Plug-in unit.

(13) To adjust the Plug-in unit, connect MG311[ ] to this Plug-in unit using the extension cable (1) (accessory) and open the PC boards in Plug-in unit using the extension cable (2) (accessory) as Fig. 3-7.

When changing a Plug-in unit, turn off POWER switch, then pull out the Plug-in unit with grasping the knob.

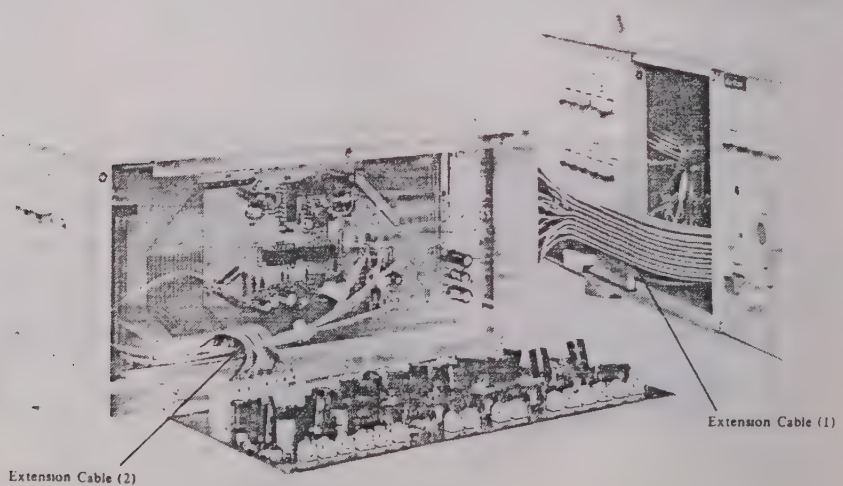


Fig. 3-7 Adjusting Condition of MG311[ ]

SECTION IV

CIRCUIT DIAGRAMS AND PC BOARD COMPONENT LOCATIONS

4.1 INTRODUCTION

This section consists of circuit diagrams and PC board component locations.

4.2 CIRCUIT DIAGRAMS AND PC BOARD COMPONENT LOCATIONS

Table 4-1 Circuit Diagram Notes

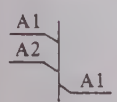
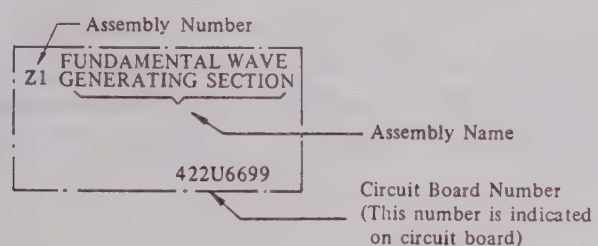
Circuit Diagram Notes	
	Resistance is in ohm, capacitance is in microfarad unless otherwise noted.
	Screwdriver adjustment.
	Encloses panel designations.
	Circuit assembly border line.
	Connection of circuits.
TP1	TP number on circuit assemblies shows location of test points.
 A1 A2 A1	It shows gathering of many signals, same signal is given same signal name.
 Assembly Number; Z1 FUNDAMENTAL WAVE GENERATING SECTION; Assembly Name; 422U6699; Circuit Board Number (This number is indicated on circuit board)	
C. L.	Component list

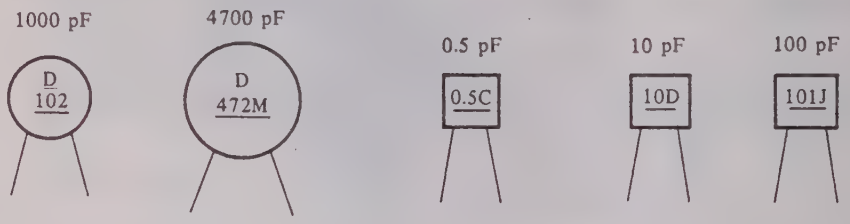
Table 4-2 Method of Reading Condenser Capacity

(a) Ceramic condenser, polyester condenser.

Indication	0.5	1	10	101	102	103	104
Capacity	0.5 pF	1 pF	10 pF	100 pF	1000 pF	0.01 μF	0.1 μF

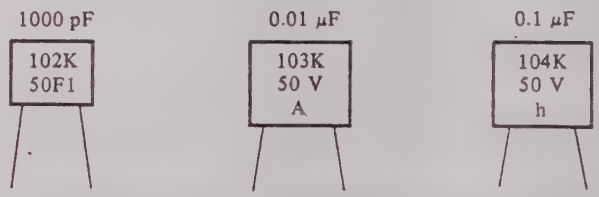
Example.

Ceramic Condenser



Capacity values are always underlined.

Polyester condenser



(b) Tantalum condenser, Metallized condenser and Electrolytic condenser.

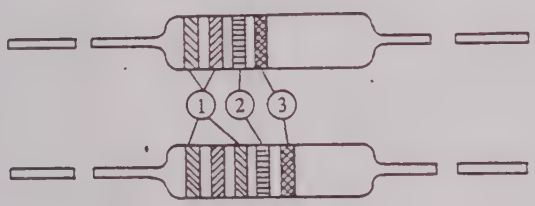
Indication	OR47	010	100	101
Capacity	0.47 μF	1 μF	10 μF	100 μF

Table 4-3 Method of Reading Resistance

Indiation of nesistance are as follows:

Color	1 Figure	2 Multiplier	Resistance Capacity
Black	0	10^0	
Brown	1	10^1	
Red	2	10^2	
Yellow red	3	10^3	
Yellow	4	10^4	
Green	5	10^5	±0.5%
Blue	6	10^6	
Purple	7	10^7	
Gray	8	10^8	
White	9	10^9	
Golden		10^{-1}	±5%

Example of indication

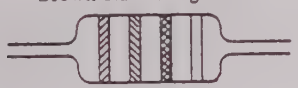


For Example;

Brown black black golden

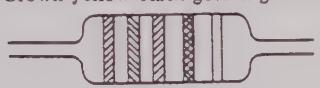
100 ±5%
10 Ω, ±5%

Brown black red golden



102 ±5%
1 kΩ, ±5%

Brown yellow black golden green



140−1 ±0.5%
14.0 Ω, ±0.5%

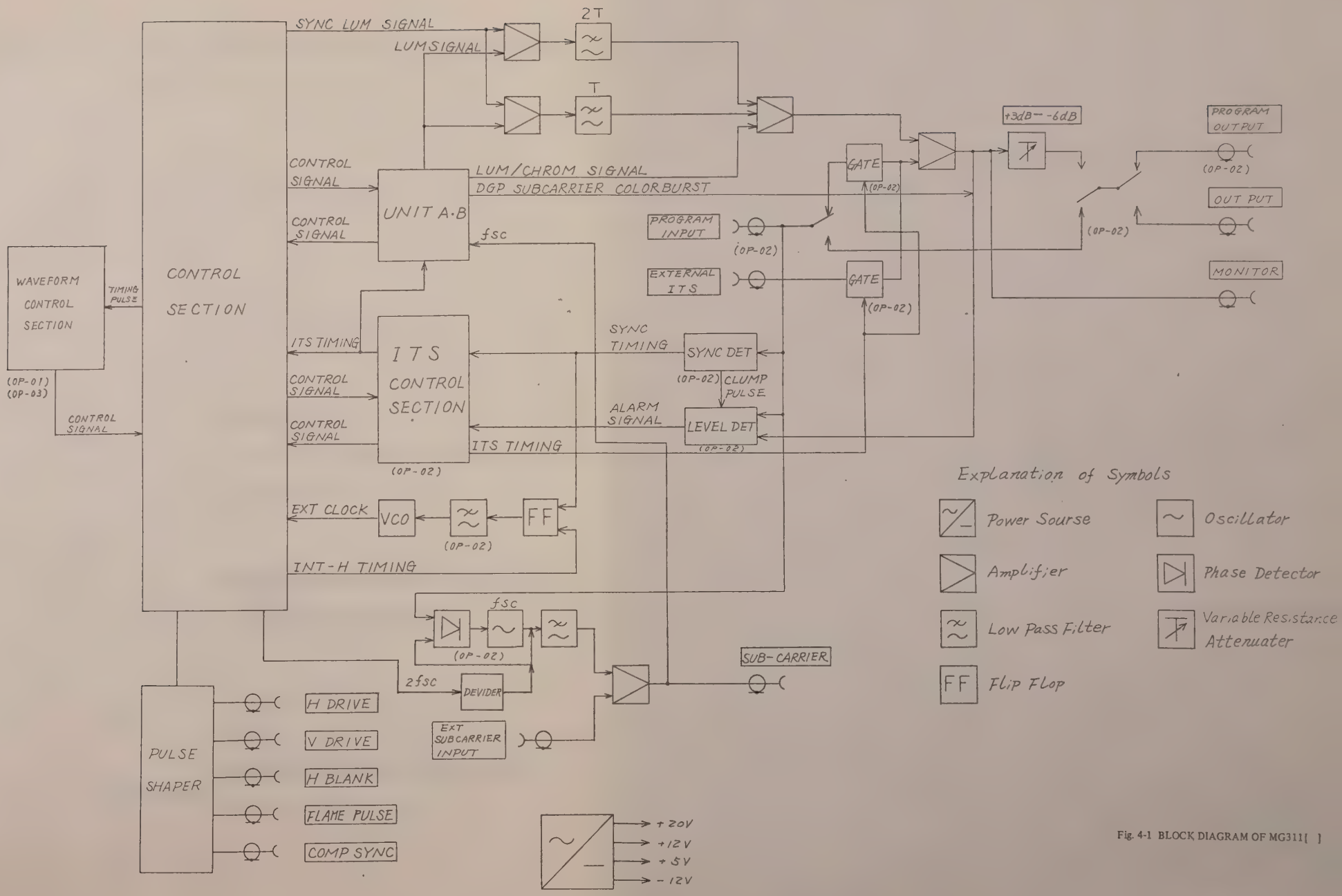


Fig. 4-1 BLOCK DIAGRAM OF MG311[ ]

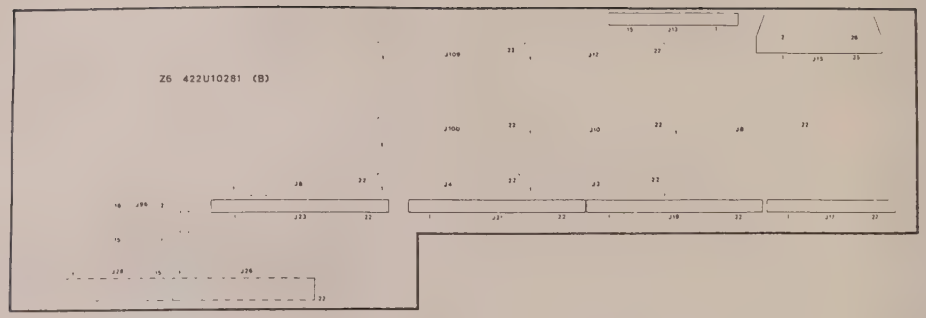


Fig. 4-2 Z6 MOTHER BOARD 1 Component Location

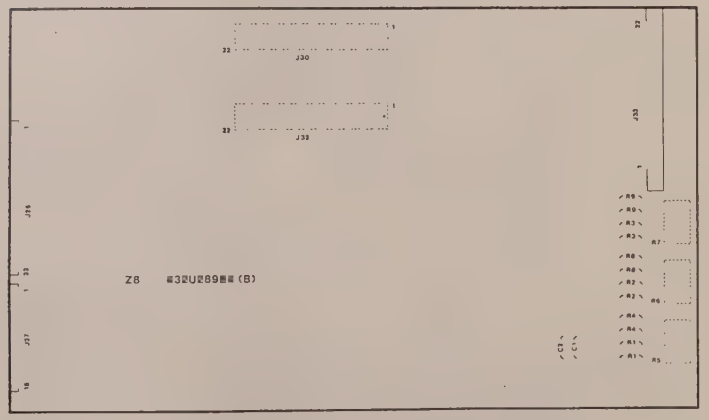


Fig. 4-4 Z8 MOTHER BOARD 3 Component Location

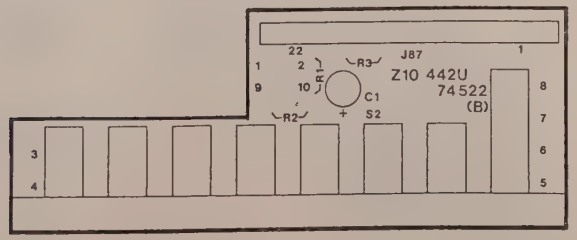


Fig. 4-6 Z10 SWITCH SECTION Component Location

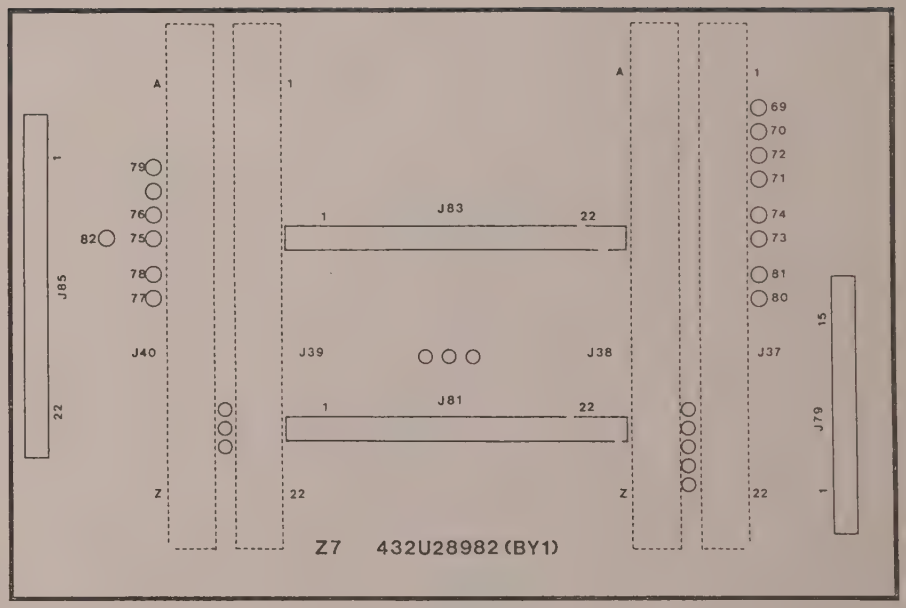


Fig. 4-3 Z7 MOTHER BOARD 2 Component Location

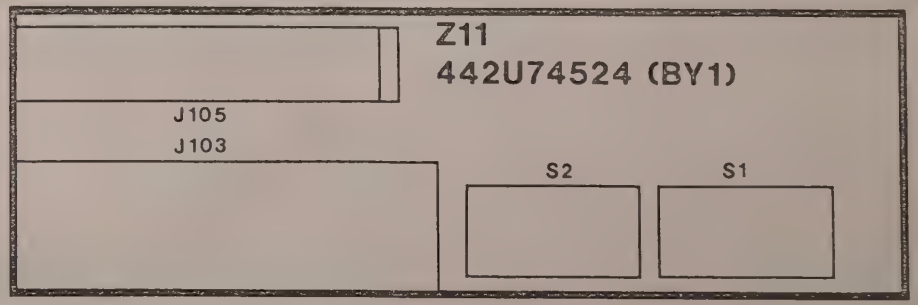
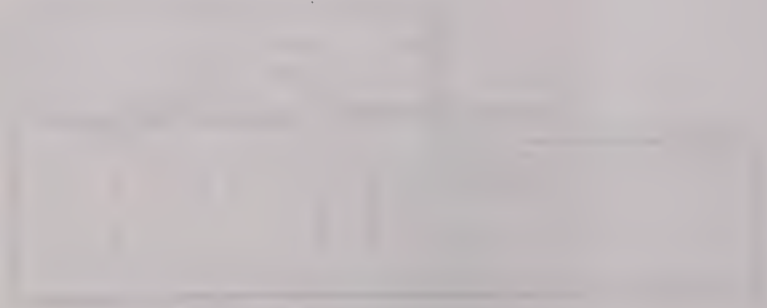
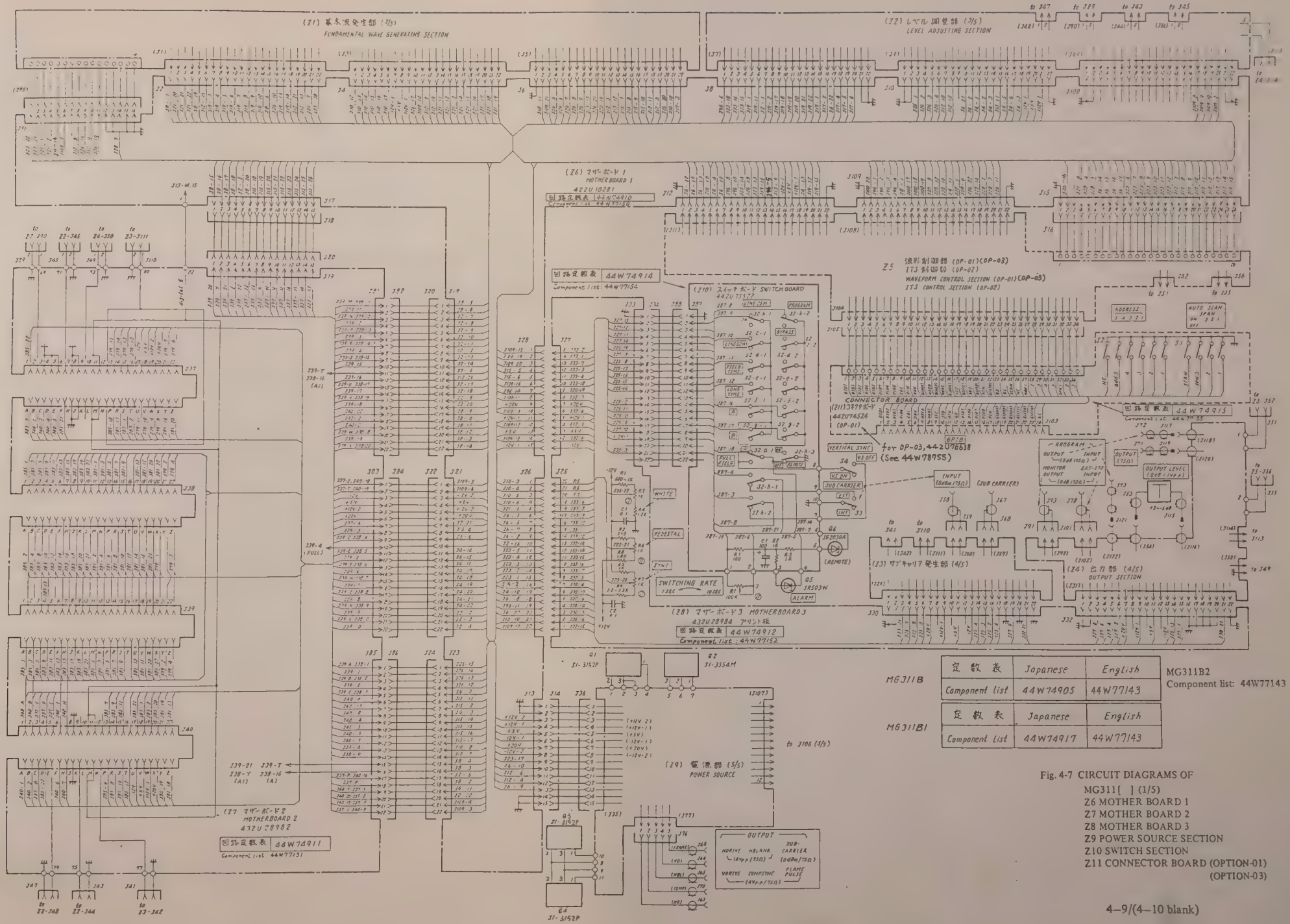


Fig. 4-5 Z11 CONNECTOR BOARD Component Location (option-01)





MG311B	定数表	Japanese	English
	Component list	44W74905	44W77143

MG311B1	定数表	Japanese	English
	Component list	44W74917	44W77143

MG311B2
Component list: 44W77143

Fig. 4-7 CIRCUIT DIAGRAMS OF
MG311[ ] (1/5)
Z6 MOTHER BOARD 1
Z7 MOTHER BOARD 2
Z8 MOTHER BOARD 3
Z9 POWER SOURCE SECTION
Z10 SWITCH SECTION
Z11 CONNECTOR BOARD (OPTION-01)
(OPTION-03)

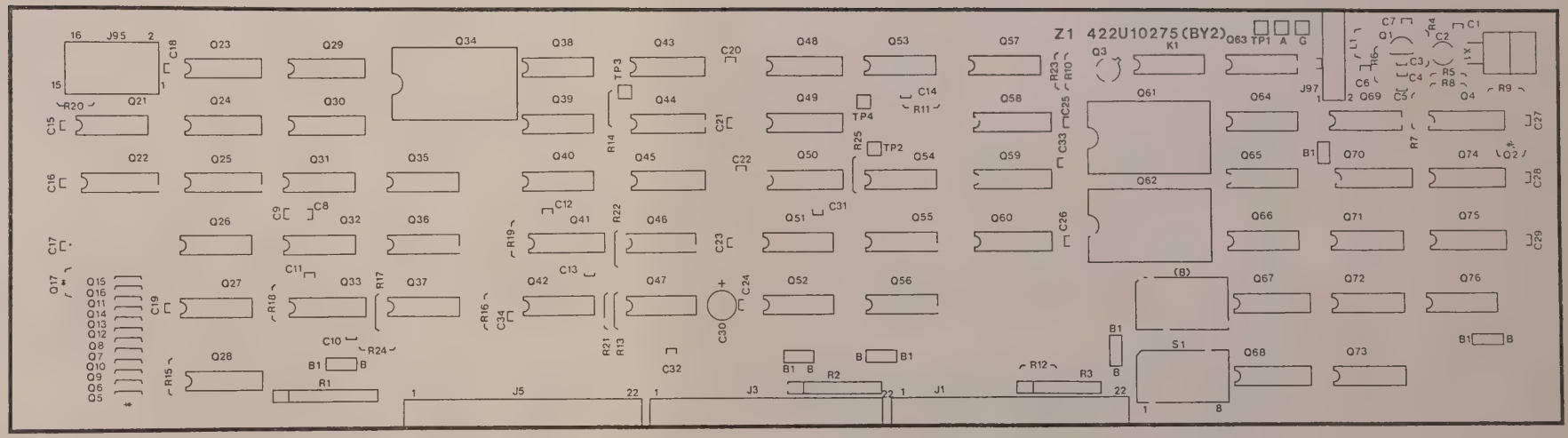


Fig. 4-8 FUNDAMENTAL WAVE GENERATING SECTION Component Location

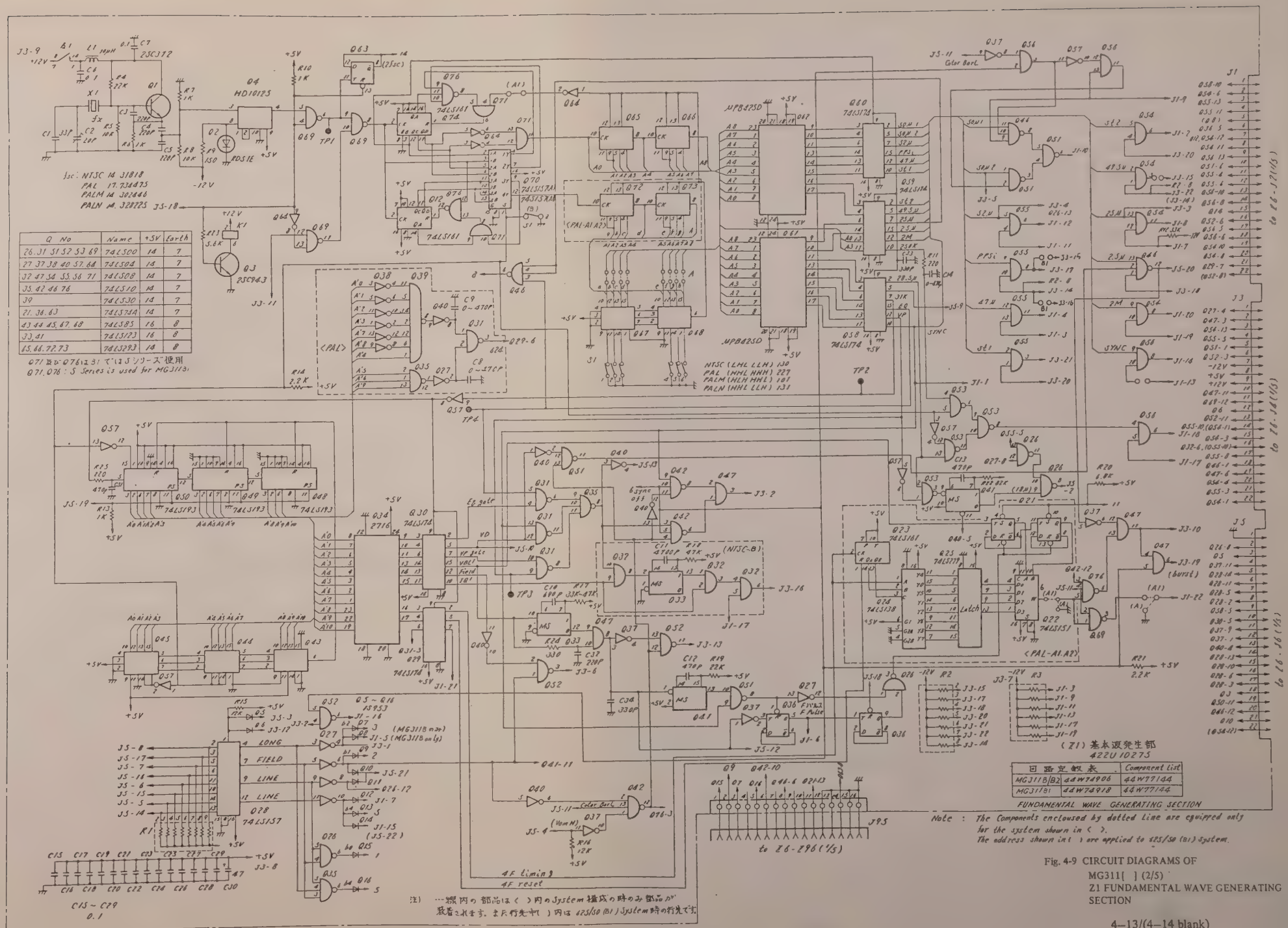

Q No | Name | +5V | Earth
26.31 51 52 53 69 | 74LS00 | 14 | 7
27 37 38 40 57 68 | 74LS04 | 14 | 7
32 47 54 55 56 71 | 74LS08 | 14 | 7
35 42 46 76 | 74LS10 | 14 | 7
39 | 74LS30 | 14 | 7
21 36 63 | 74LS74A | 14 | 7
43 44 45 67 60 | 74LS85 | 16 | 8
33 41 | 74LS123 | 16 | 8
65 66 72 73 | 74LS293 | 14 | 8
Q71 及び Q76 は S シリーズ使用
Q71, Q76 : S Series is used for MG311B
Jsc : NTSC 14 31818
PAL 17.734475
PALM 14 302446
PALN 14 328725
NTSC (LHL LLH) 130
PAL (HHL HHH) 227
PALM (HLH HHL) 181
PALN (HHL LLH) 131
(PAL)
(PAL-A1,A2)
LONG
FIELD
LINE
LINE
4F limit
4F reset
Color Burst
Eq pulse
VD
Field
Latch
SYNC
回路定数表
Component List
MG311B/B2 44W74906 44W77144
MG311B1 44W74918 44W77144
(Z1) 基本波発生部
422U10275
FUNDAMENTAL WAVE GENERATING SECTION
Note : The Components enclosed by dotted line are equipped only for the system shown in ( ).
The address shown in( ) are applied to 525/50 (B1) system.
注) …線内の部品は( )内のSystem構成の時のみ部品が取着されます。また行先中( )内は525/50(B1)System時の行先です。
to Z6-Z96(1/5)
to Z6-J2(1/5)
to Z6-J4(1/5)
to Z6-J6(1/5)

Fig. 4-9 CIRCUIT DIAGRAMS OF MG311[ ] (2/5)
Z1 FUNDAMENTAL WAVE GENERATING SECTION

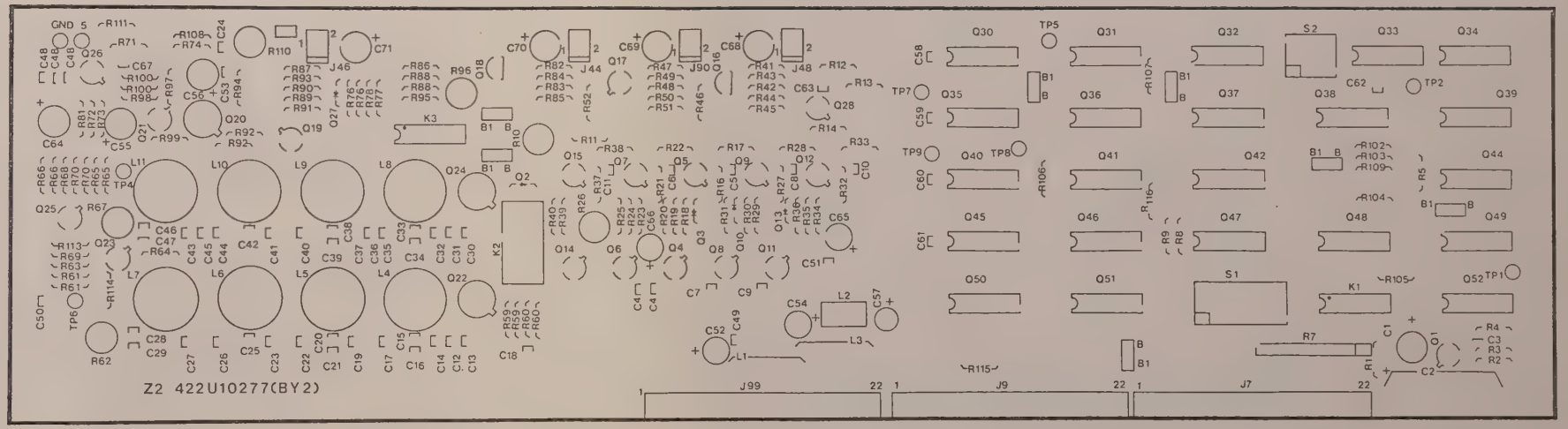


Fig. 4-10 Z2 LEVEL ADJUSTING SECTION Component Location

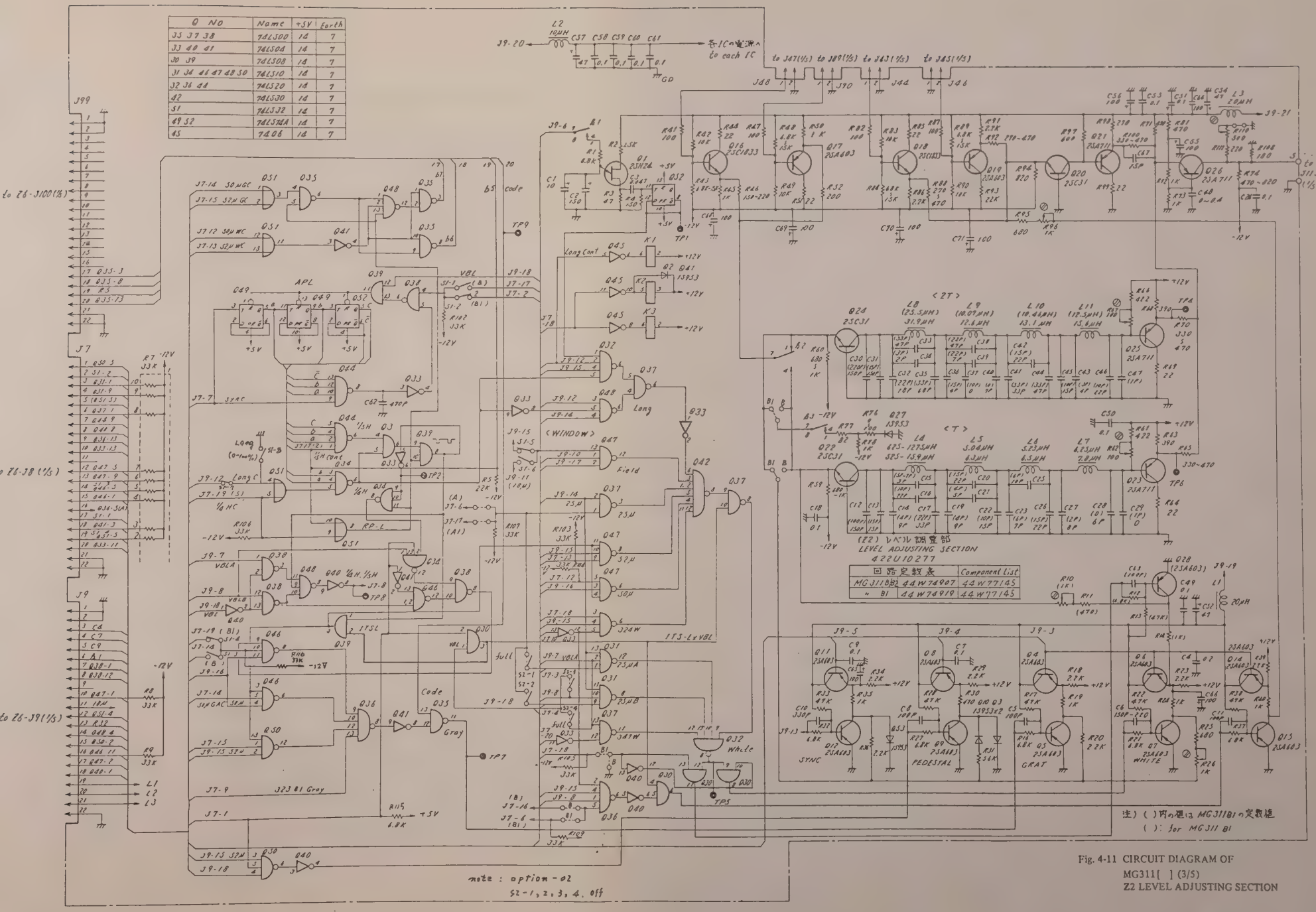


Fig. 4-11 CIRCUIT DIAGRAM OF
MG311[ ] (3/5)
Z2 LEVEL ADJUSTING SECTION

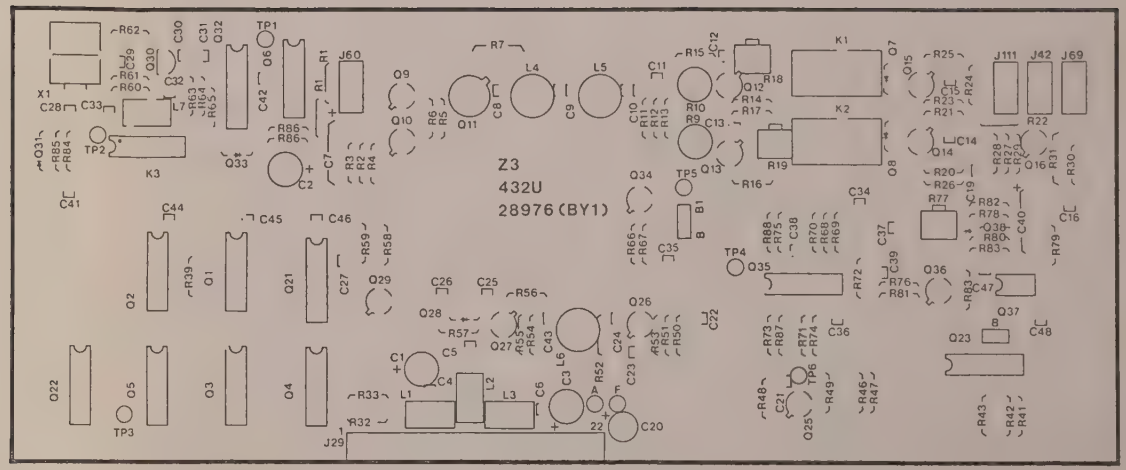


Fig. 4-12 Z3 SUBCARRIER GENERATING SECTION Component Location

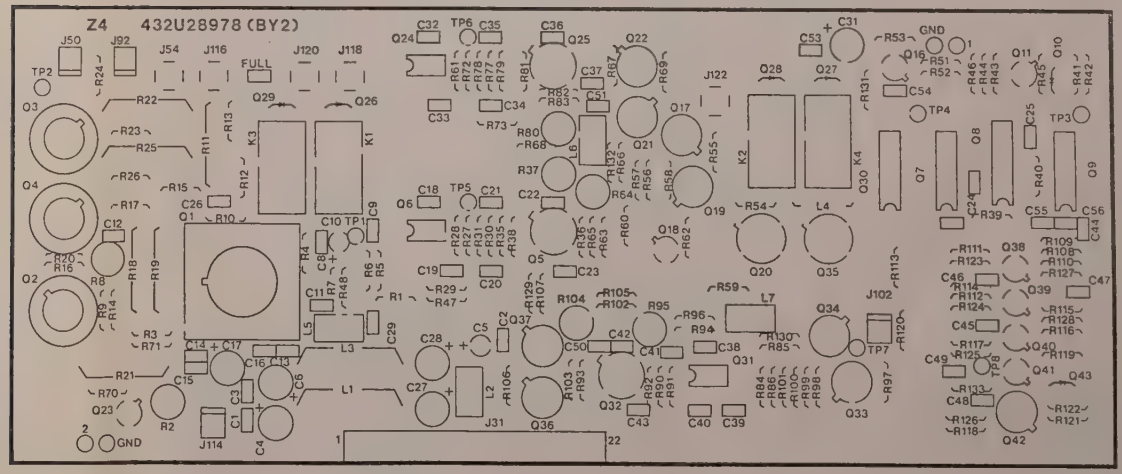
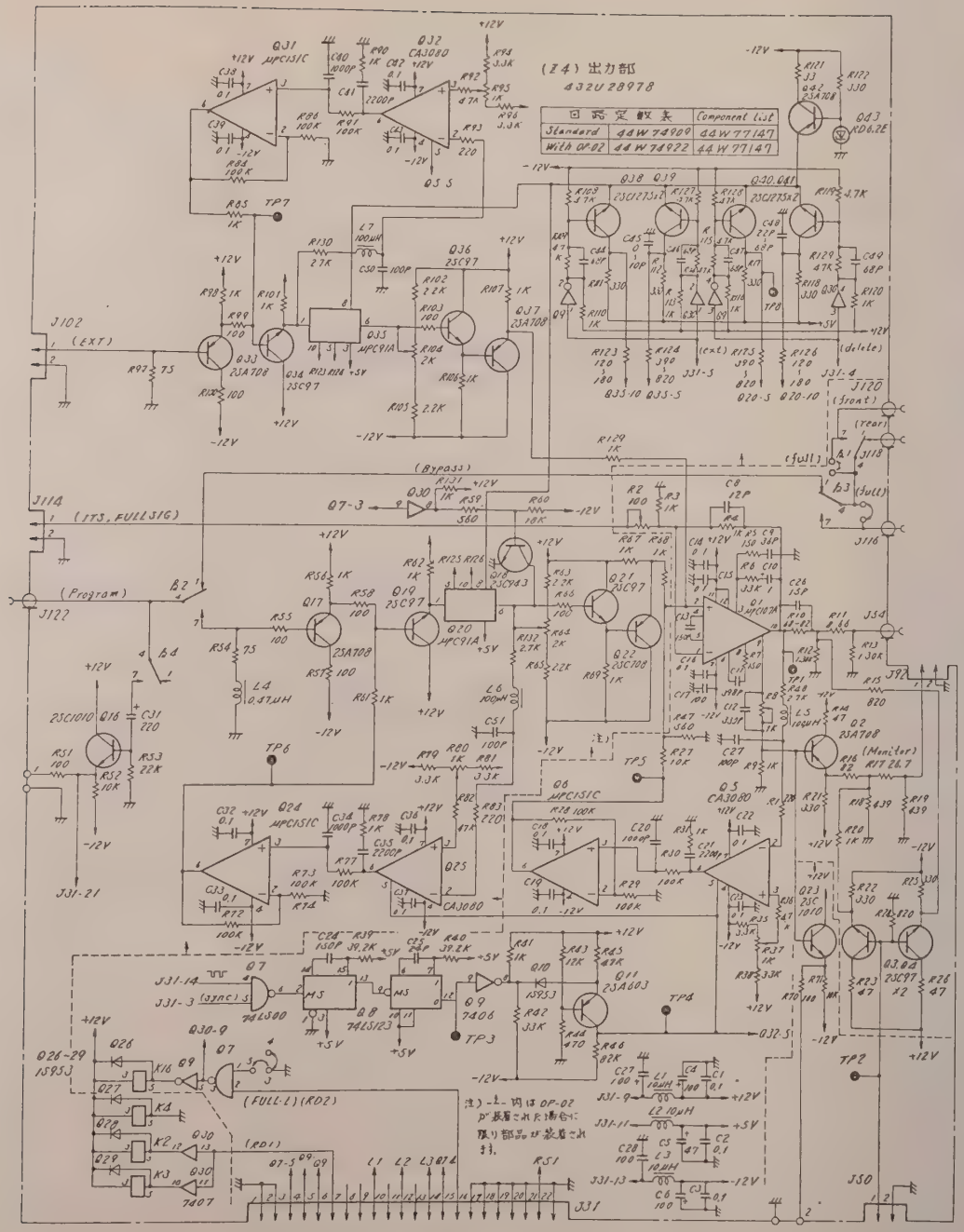
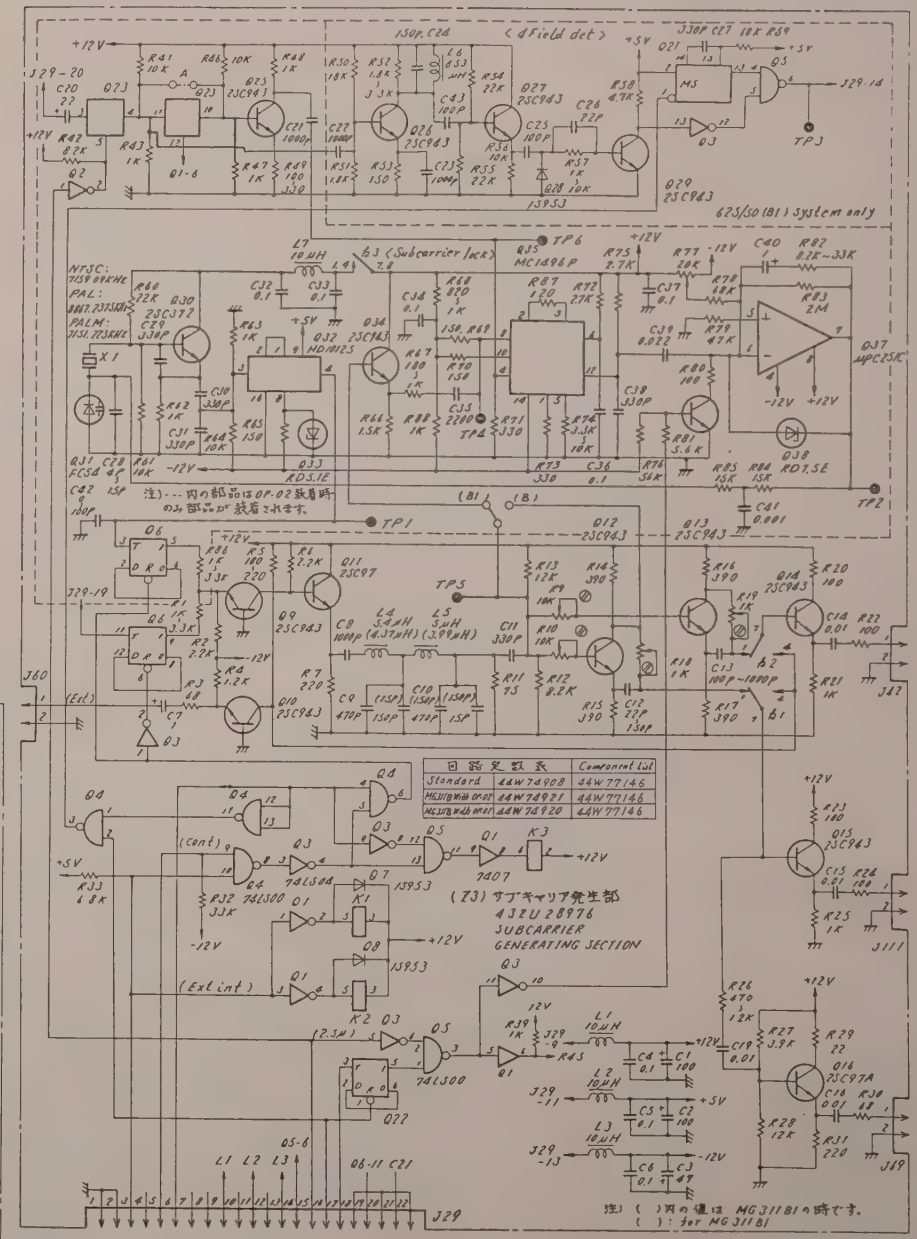


Fig. 4-13 Z4 OUTPUT SECTION Component Location





注) 同図は OP-02 の回路も含まれています。
破線部は部品定数表参照。

Note: The components enclosed by dotted line are equipped when option 02 is specified. See component list for details.

Fig. 4-14 CIRCUIT DIAGRAM OF MG311[ ] (4/5)
Z3 SUBCARRIER GENERATING SECTION
Z4 OUTPUT SECTION

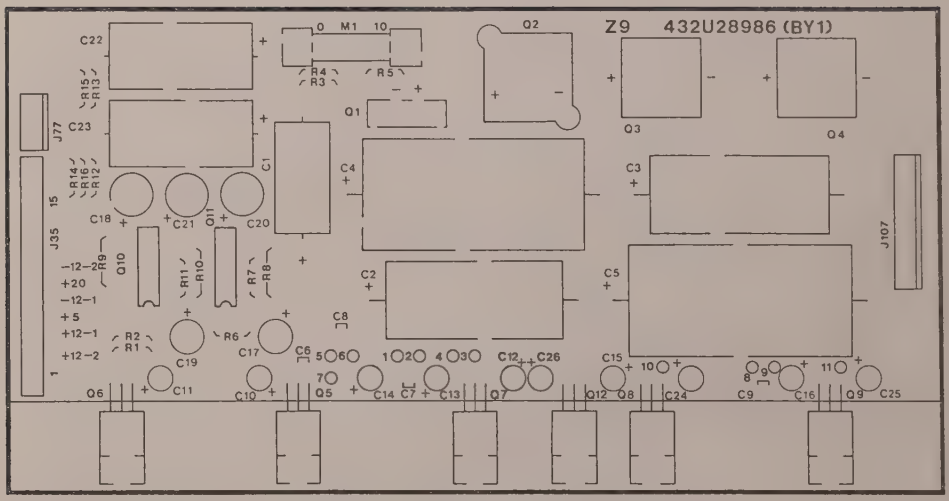


Fig. 4-15 Z9 POWER SOURCE SECTION Component Location

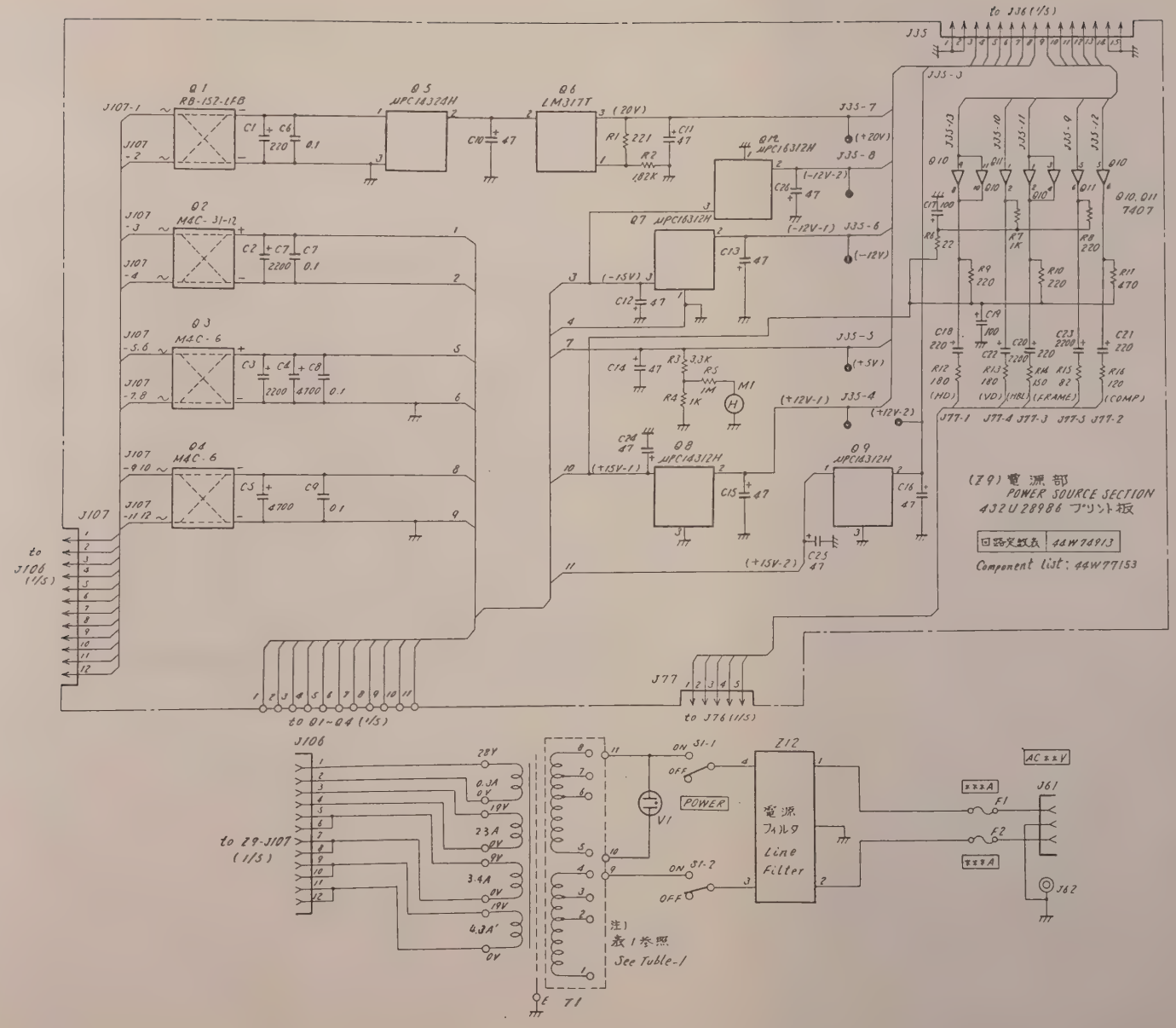


表 1
Table-1

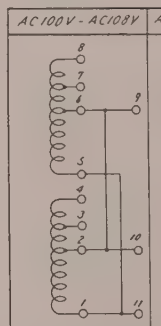
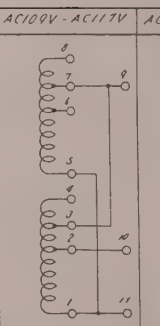
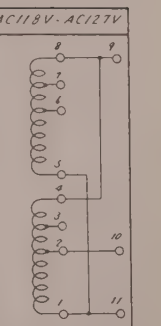
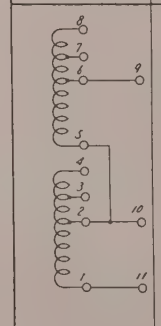
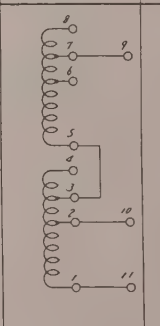
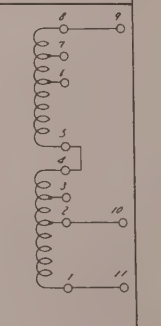
AC100V - AC108V	AC109V - AC117V	AC118V - AC127V
		
AC200V - AC216V	AC217V - AC234V	AC235V - AC254V
		

Fig. 4-16 CIRCUIT DIAGRAM OF MG311[ ] (5/5)
Z9 POWER SOURCE SECTION

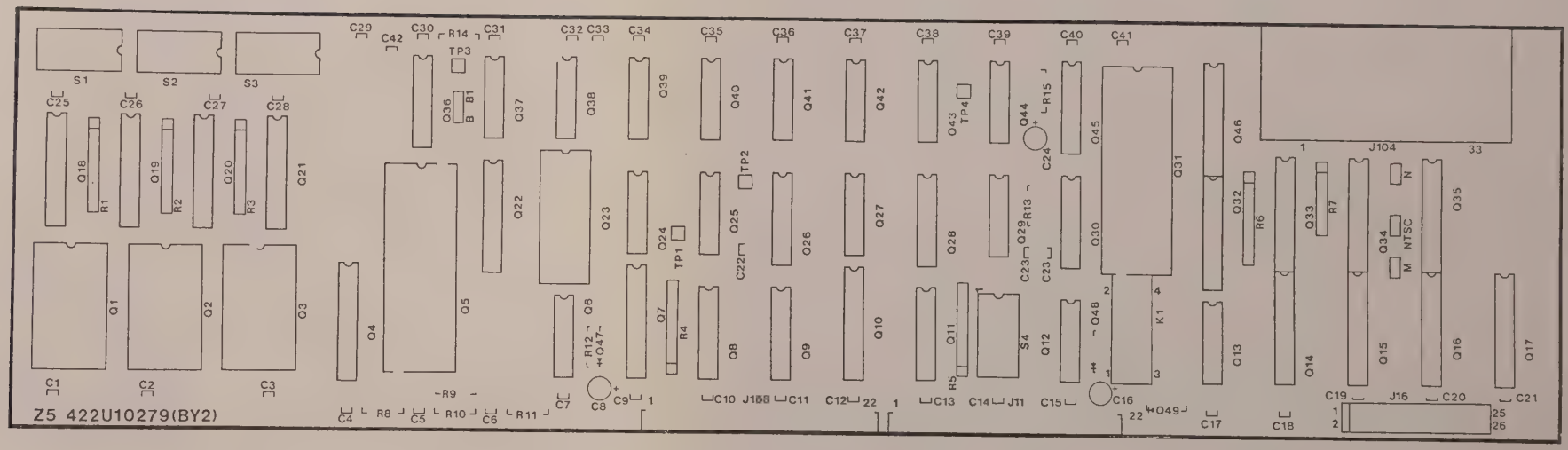


Fig. 4-17 Z5 WAVEFORM CONTROL SECTION (OP-01) Component Location

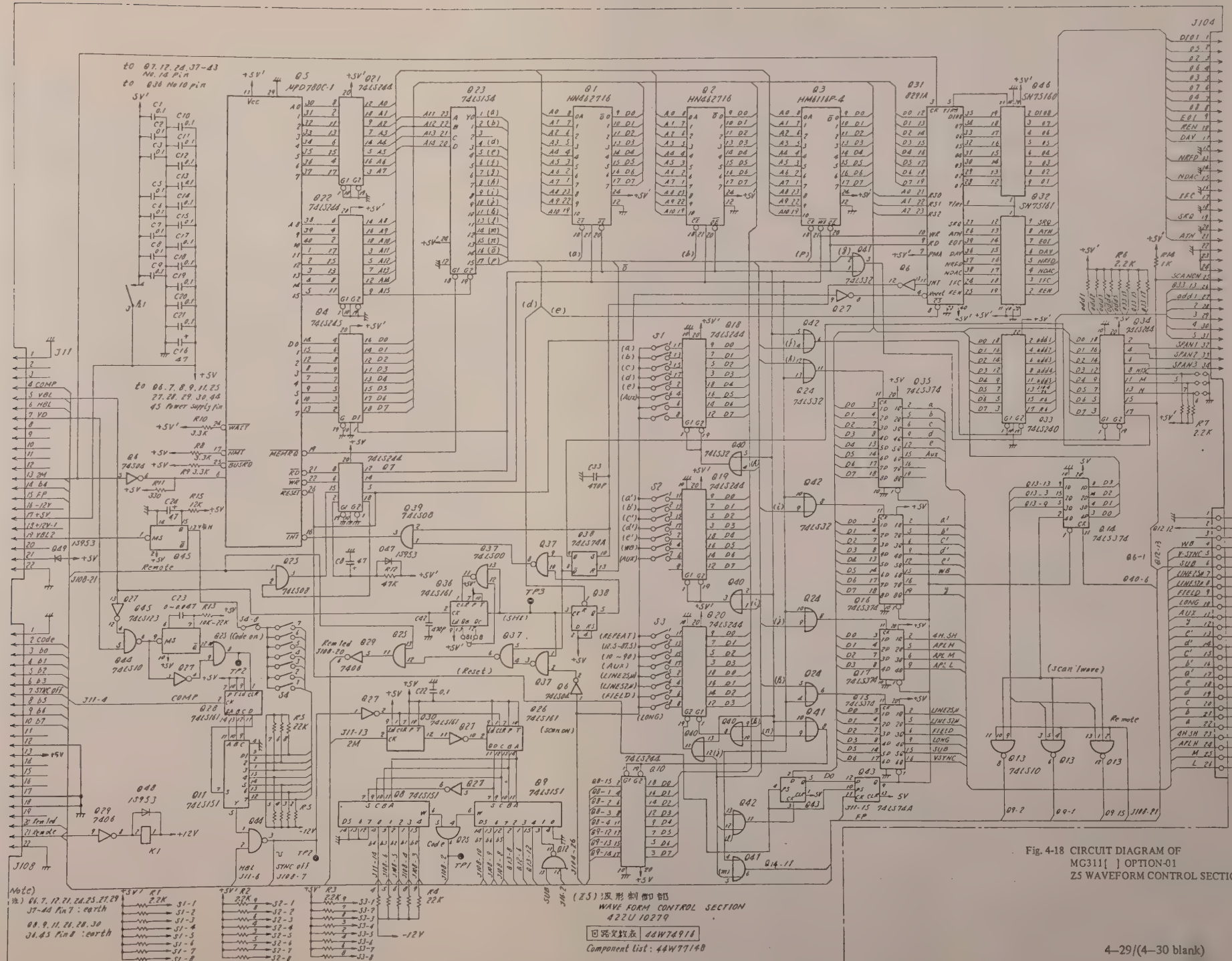


Fig. 4-18 CIRCUIT DIAGRAM OF
MG311[ ] OPTION-01
Z5 WAVEFORM CONTROL SECTION

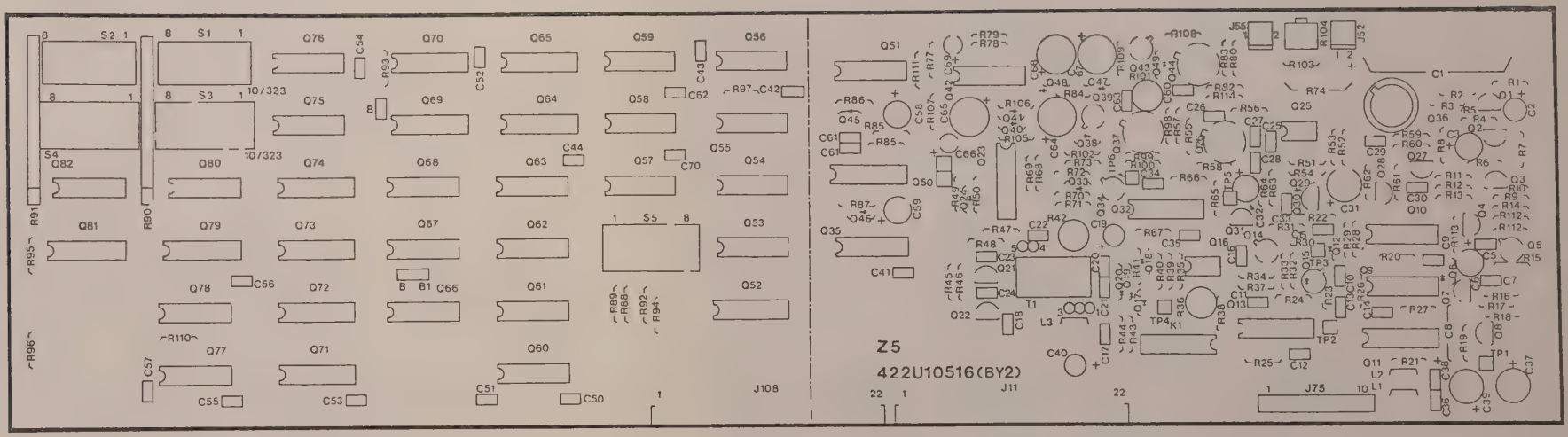


Fig. 4-19 Z5 ITS CONTROL SECTION (OP-02) Component Location

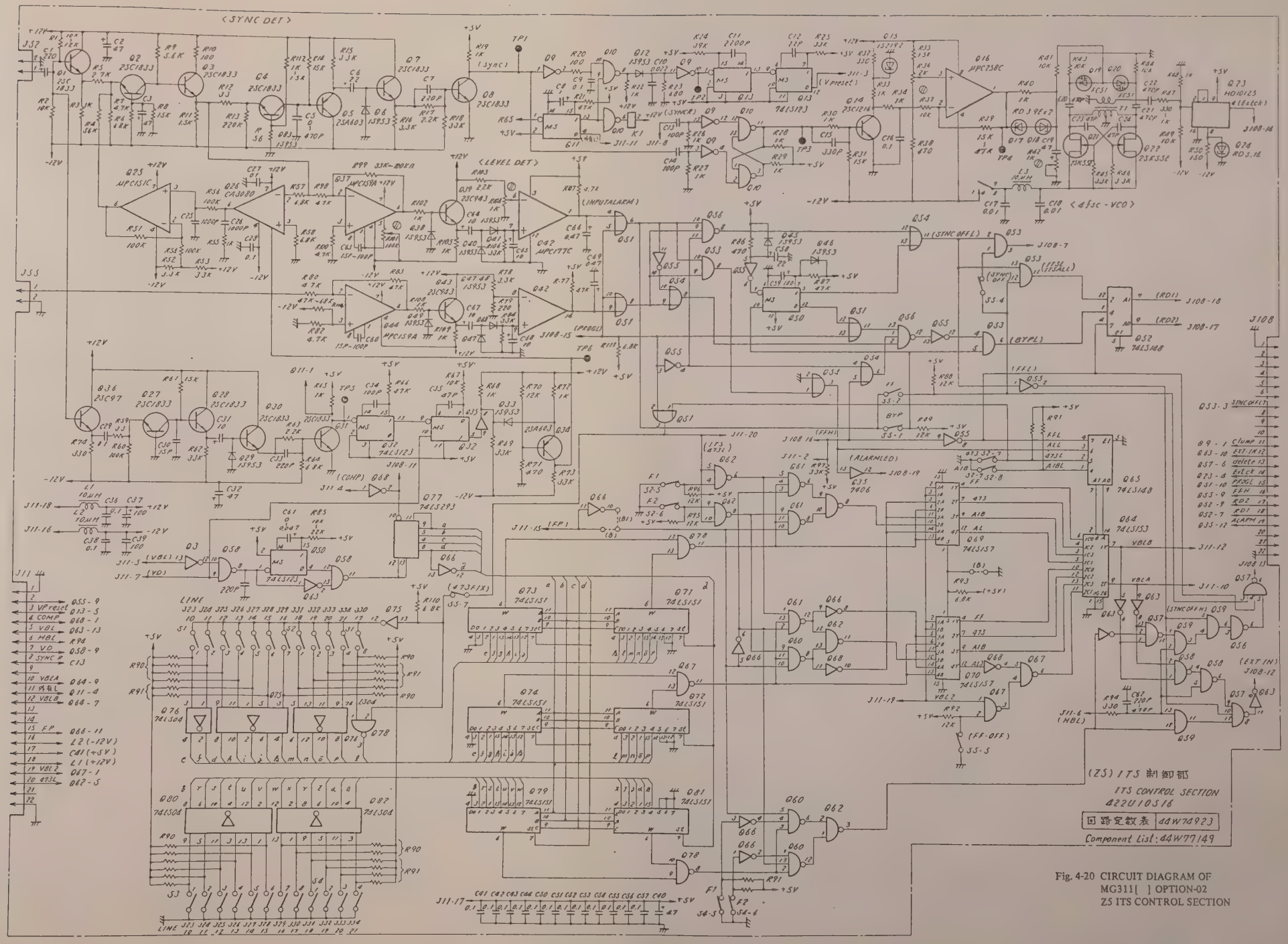


Fig. 4-20 CIRCUIT DIAGRAM OF
MG311[ ] OPTION-02
Z5 ITS CONTROL SECTION

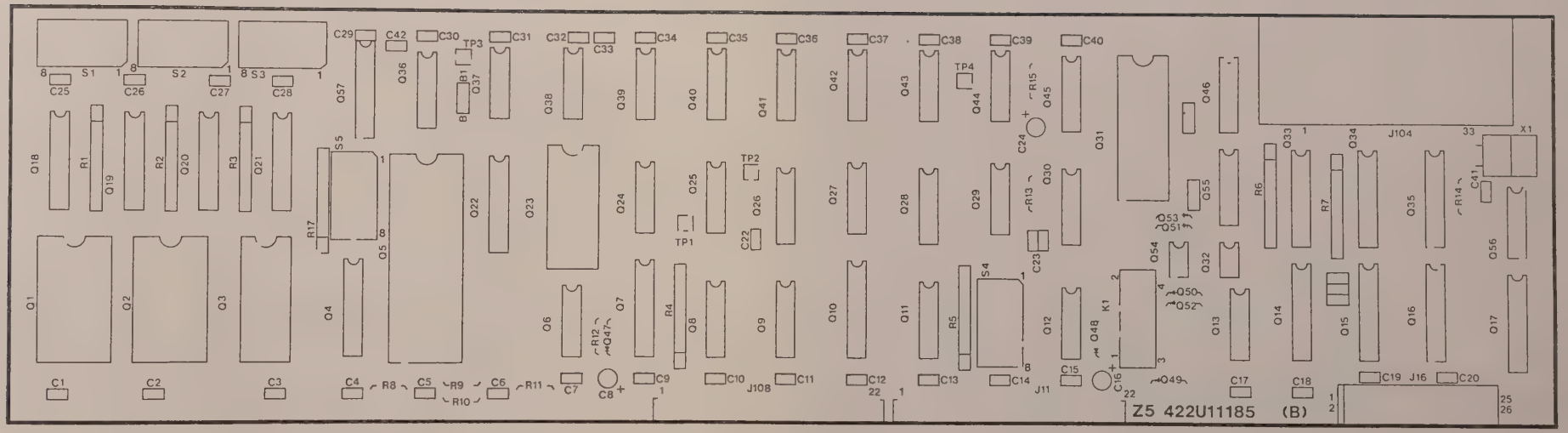
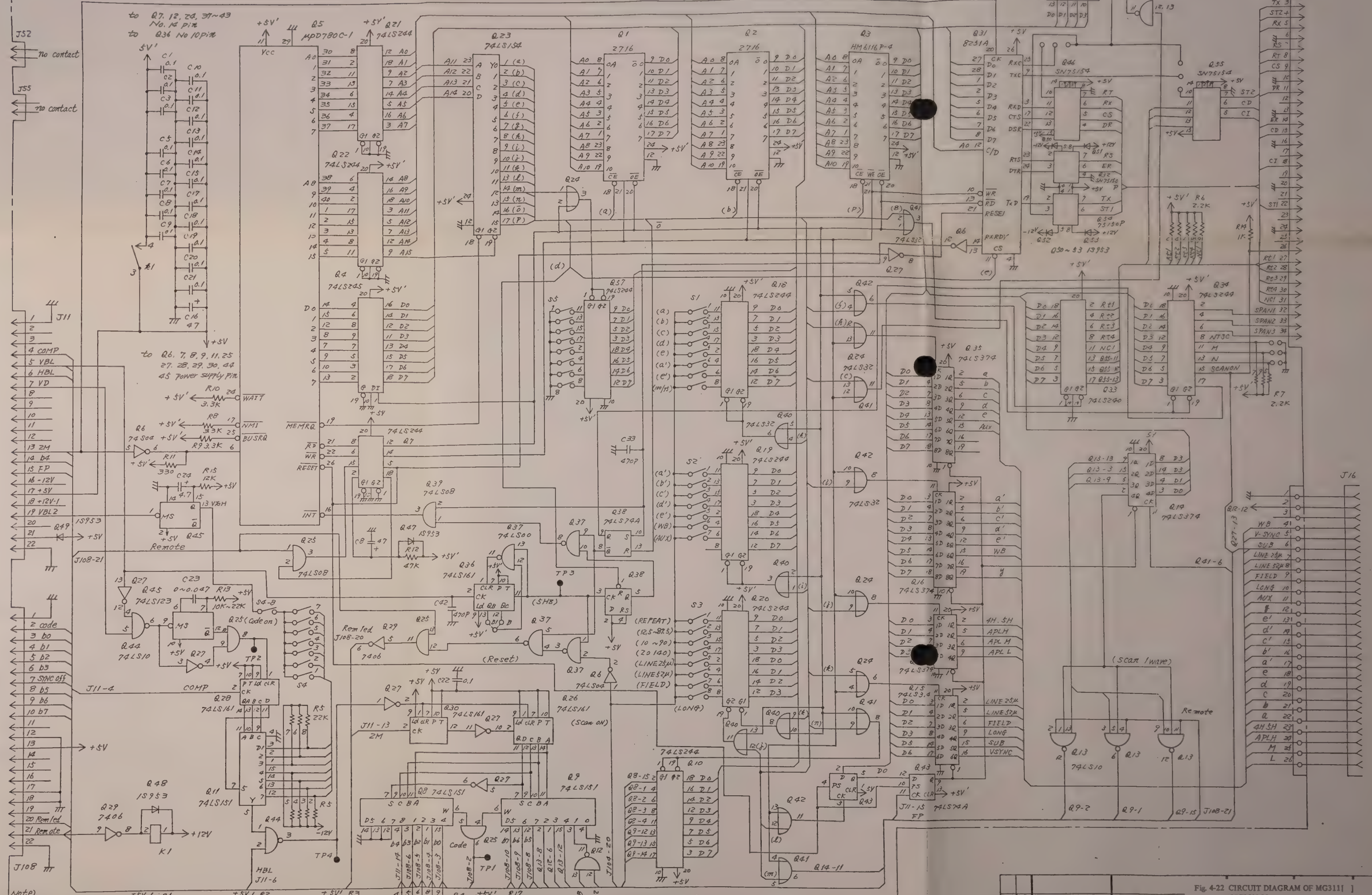


Fig. 4-21 Z5 WAVEFORM CONTROL SECTION (OP-03) Component Location

関係図番

記号	来歴	年月日	氏名	承認



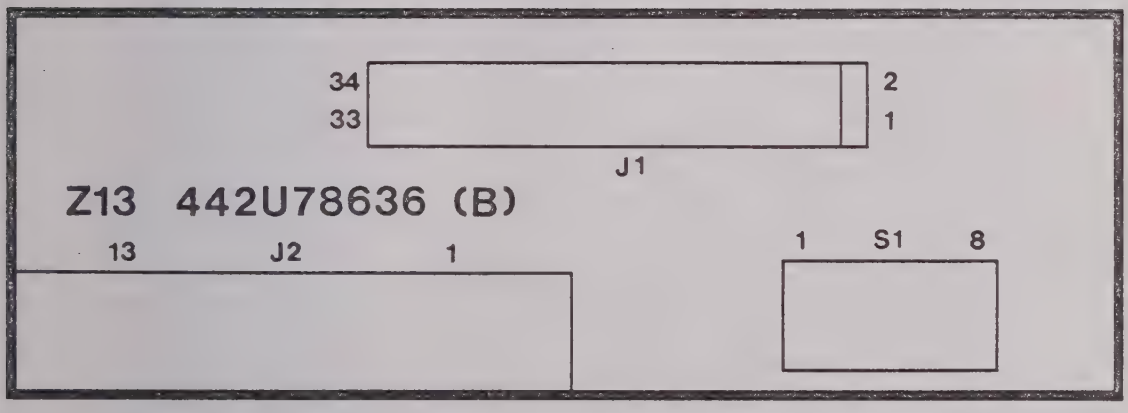
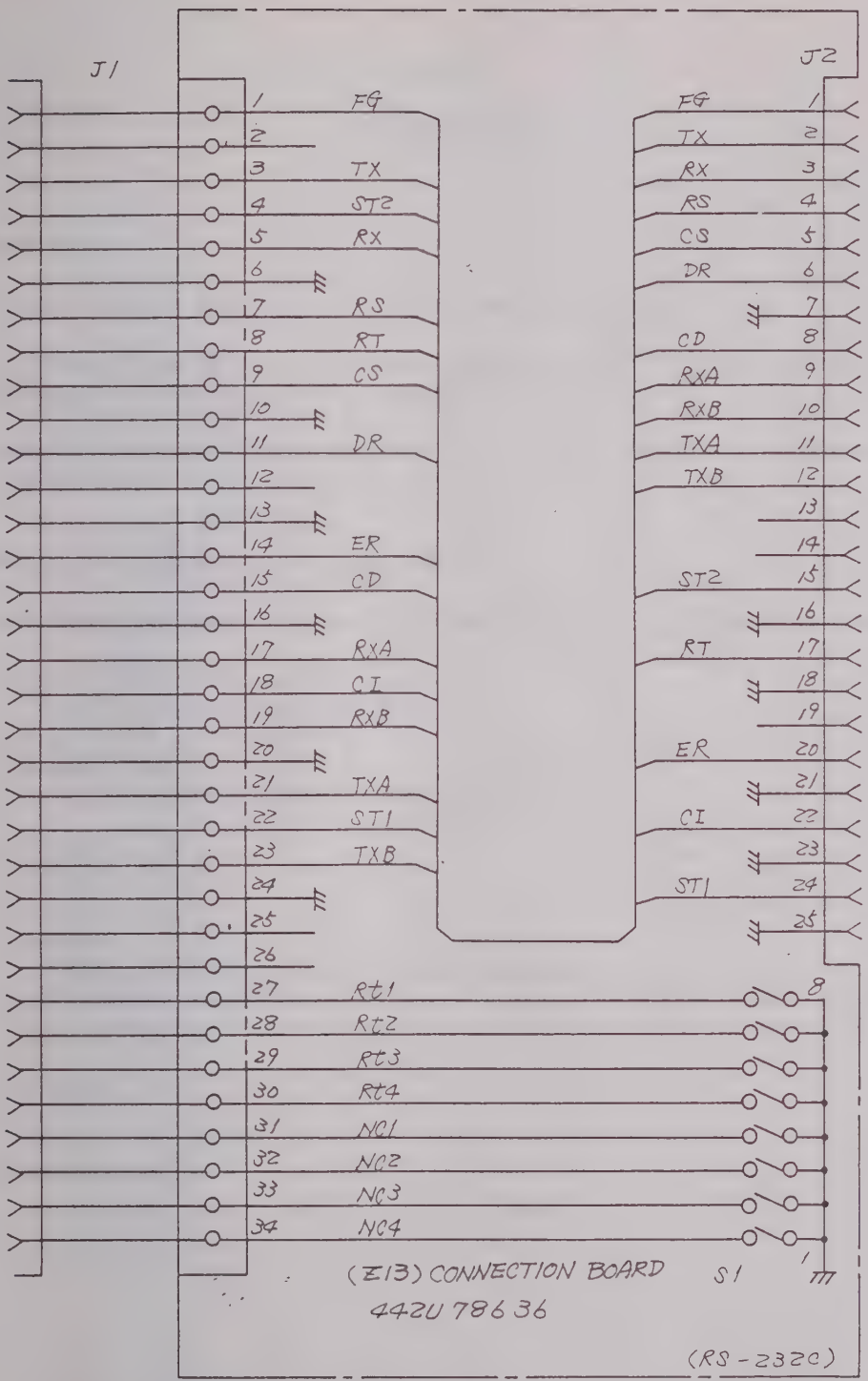


Fig. 4-23 Z13 CONNECTOR BOARD (OP-03) Component Location

関係図番	記号	来歴	年月日	氏名	承認



Component List	44W 78756

Component List : 44W83020

Fig. 4-24 CIRCUIT DIAGRAM OF MG311[ ]
OPTION-03
Z13 CONNECTOR BOARD

質	処	理	記	事

A	品番 作番	図	検図	承認	名称
					CONNECTION BOARD (OP-03) Z13

番 44W 78755 1/1

SECTION V

COMPONENT LISTS

5.1 INTRODUCTION

This section contains informations relative to ordering replacement components.

The following table shows circuit reference (hereinafter CKT REF) and abbreviations used for components given in the component list (hereinafter C.L.).

In the C.L., the quantity of each component is one so far as no quantitative description is given in the "NOTE" column.

5.2 ORDERING OF COMPONENTS FOR REPLACEMENT

Upon ordering components, please give the following descriptions by referring to the C.L.

(1) Name of the Test Set or the Plug-in Unit
E.g. Test Signal Generator MG311B1

(2) Assembly Number and Name
E.g. Z1, Fundamental Wave Generating Section.

(3) CKT REF
E.g. Q5

(4) Part Name
Part name is given in column of parts name in the C.L. Components with asterisks (*) are those that require factory adjustment upon repairing. When ordering a components or component with asterisk (*), give fully description of the component or components.

(5) Quantity

5.3 COMPONENT LISTS

Table 5-1 Circuit Reference and Abbreviations Used in Components List

CKT REF

AT:	Attenuator	P:	Lamp
C:	Capacitor	Q:	Transistor, diode, rectifier, IC
F:	Fuse	R:	Resistor
J:	Jack, plug, connector	S:	Switch
K:	Relay	T:	Transformer
L:	Coil	V:	Neon lamp, vaccuemtube
M:	Meter, timer	Z:	Unit

Abbreviations

A:	amperes	Muliti:	multiplying
Att, R var:	Attenuator variable using film resistive elements	Nch:	N channel
		non-line:	non-linear taper
BL:	boundary layer	Non-pol:	non-polarity
Cer:	ceramic	NPN:	negative-positive-negative
CF:	carbon film	Ω:	ohms
Comp:	composition	p:	pico (x 10^{-12})
CRT:	cathode-ray tube	Plast:	plasic film
Di:	diode	PMTR:	potentiometer
DIL type:	dual-in type	PNP:	positive-negative-positive
Elect:	electrolyte aluminum	p-p, pp:	peak to peak value
F:	farad	RFC:	RF choke
FET:	field effect transistor	R-lamp:	Resistor lamp
G:	ground	rms:	effective value (route means square)
Ge:	germanium	SBD:	shottky barrier diode
H:	henry	SCR:	sillicon controlled rectifier
Hz:	hertz	Si:	sillicon
IC:	integrated circuit	SRD:	step recovery diode
J-FET:	junction FET	Tant:	tantalum
k:	kilo (x 10^3)	Tr:	transistor
LED:	light emitting diode	Trans:	transformer
M:	mega (x 10^6)	μ:	micro (x 10^{-6})
m:	milli (x 10^{-3})	V:	volt
MF:	metallized film	Var:	variable
MOS-FET:	metal oxide semiconductor FET	WW:	wire wound
M paper:	metallized paper	XTAL:	crystal
M plast:	metallized plastic film		

COMPONENT LIST OF VIDEO SIGNAL GENERATOR MG311[ ]

KT EF	DESCRIPTION	RATING	NOTE
1	Att,(439R22390)	1dB×10	
1	Fuse,(MF51NN250V 3.15A AC05)	3.15A,250V	AC100V to 127V
	Fuse,(MF51NN250V 2A AC05)	2A,250V	AC200V to 254V
2	Fuse,(MF51NN250V 3.15A AC05)	3.15A,250V	AC100V to 127V
	Fuse,(MF51NN250V 2A AC05)	2A,250V	AC200V to 254V
1 to 13	Not assigned		
14	Connector,(U-SB1503)	15 pins	
15	Not assigned		
16	Not assigned		
17	Not assigned		
18	Connector,(U-SB1503)	15 pins	
19	Not assigned		
20	Connector,(U-SB2203)	22 pins	
21	Not assigned		
22	Connector,(U-SB2203)	22 pins	
23	Not assigned		
24	Connector,(U-SB2203)	22 pins	
25 to 33	Not assigned		
34	Connector,(U-SB2203)	22 pins	
35	Not assigned		
36	Connector,(U-SB1503)	15 pins	
37	Not assigned		
38	Not assigned		
39	Not assigned		
40	Not assigned		
41	Connector,(PI011-2F)		
42	Not assigned		
43	Connector,(PI011-2F)		
44	Not assigned		
45	Connector,(PI011-2F)		
46	Not assigned		
47	Connector,(PI011-2F)		
48	Not assigned		
49	Connector,(PI011-2F)		
50	Not assigned		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF VIDEO SIGNAL GENERATOR MG311[ ]

CKT REF	DESCRIPTION	RATING	NOTE
J 51	Connector,(PI011-2F)		Q'ty 0 or 1, OP-02
J 52	Not assigned		
J 53	Plug,(34J44371, 27DP-P-1.5)		
J 54	Not assigned		
J 55	Connector,(PI011-2F)		Q'ty 0 or 1, OP-02
J 56	Not assigned		
J 57	Not assigned		
J 58	Receptacle,(BNC-R-101)		
J 59	Connector,(PI011-2F)		
J 60	Not assigned		
J 61	Inlet,(PA-125)		
J 62	Terminal,(34E772)		
J 63	Receptacle,(BNC-R-101)		
J 64	Receptacle,(BNC-R-101)		
J 65	Receptacle,(BNC-R-101)		
J 66	Receptacle,(BNC-R-101)		
J 67	Receptacle,(BNC-R-101)		
J 68	Connector,(PI011-2F)		
J 69	Not assigned		
J 70	Receptacle,(BNC-R-101)		
J 71	Receptacle,(BNC-R-101)		
J 72	Receptacle,(BNC-R-101)		Q'ty 0 or 1, OP-02
J 73	Receptacle,(BNC-R-101)		
J 74	Not assigned		
J 75	Not assigned		
J 76	Connector,(PI011-5F)		
J 77	Not assigned		
J 78	Receptacle,(BNC-R-101)		Q'ty 0 or 1, OP-02
J 79	Not assigned		
J 80	Connector,(U-SB1503)	15 pins	
J 81	Not assigned		
J 82	Connector,(U-SB2203)	22 pins	
J 83	Not assigned		
J 84	Connector,(U-SB2203)	22 pins	
J 85	Not assigned		
J 86	Connector,(U-SB2203)	22 pins	
J 87	Not assigned		
J 88	Connector,(U-SB2203)	22 pins	
J 89	Connector,(PI011-2F)		
J 90	Not assigned		
J 91	Connector,(PI011-2F)		
J 92	Not assigned		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF VIDEO SIGNAL GENERATOR MG311[ ]

KT EF	DESCRIPTION	RATING	NOTE
93	Receptacle,(BNC-R-101)		
94	Connector,(PI011-2F)		
95	Not assigned		
96	Not assigned		
97	Not assigned		
98	Not assigned		
99	Not assigned		
100	Not assigned		
101	Connector,(PI011-2F)		Q'ty 0 or 1, OP-02
102	Not assigned		
103	Not assigned		
104	Not assigned		
105	Not assigned		
106	Connector,(PI011-12F)		
107	Not assigned		
108	Not assigned		
109	Not assigned		
110	Connector,(PI011-2F)		
111	Not assigned		
112	Not assigned		
113	Connector,(PI011-2F)		
114	Not assigned		
115	Plug,(34J44371, 27DP-P-1.5)		
116	Not assigned		
117	Plug,(34J44731, 27DP-P-1.5)		Q'ty 0 or 1, OP-02
118	Not assigned		
119	Plug,(34J44371, 27DP-P-1.5)		
120	Not assigned		
121	Plug,(34J44371, 27DP-P-1.5)		Q'ty 0 or 1, OP-02
122	Not assigned		
Q 1	IC,(S1-3152P)		
Q 2	IC,(S1-3554M)		
Q 3	IC,(S1-3152P)		
Q 4	IC,(S1-3152P)		
Q 5	LED,(SR503W)		
Q 6	LED,(SG203DA)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF VIDEO SIGNAL GENERATOR MG311[ ]

CKT REF	DESCRIPTION	RATING	NOTE
R 1	Var,CF,(RV24YN20SB 100kΩ)	100kΩ	
S 1	Pushbutton,(NE15-J2)		
S 2	Not assigned		
S 3	Pushbutton,(44S52717)		
S 4	Pushbutton,(44S52717)		
T 1	Power trans,(44T68791)	155VA	
V 1	Lamp,(34F75361BNS-3RV)		
Z 1	FUNDAMENTAL WAVE GENERATING SECTION		
Z 2	LEVEL ADJUSTING SECTION		
Z 3	SUBCARRIER GENERATING SECTION		
Z 4	OUTPUT SECTION		
Z 5	WAVEFORM CONTROL SECTION		Q'ty 0 or 1, OP-01
	ITS CONTROL SECTION		Q'ty 0 or 1, OP-02
Z 6	MOTHER BOARD 1		
Z 7	MOTHER BOARD 2		
Z 8	MOTHER BOARD 3		
Z 9	POWER SOURCE		
Z 10	SWITCH BOARD		
Z 11	CONNECTOR BOARD		Q'ty 0 or 1, OP-01
Z 12	Power filter, (ZMB2203-13)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF FUNDAMENTAL WAVE GENERATING SECTION Z1

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Cer,(CC924CH1H330J)	33pF,±5%,50V	
C 2	Var,cer,(TZ03R200A)	0 to 20pF,100V	
C 3	Cer,(CC924CH1H221J)	220pF,±5%,50V	
C 4	Cer,(CC924CH1H221J)	220pF,±5%,50V	
C 5	Cer,(CC924CH1H221J)	220pF,±5%,50V	
C 6	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 7	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 8	Not assigned		
C 9	Not assigned		
C 10	Cer,(CC924CH1H331J) Cer,(CC924CH1H471J)	330pF,±5%,50V 470pF,±5%,50V	}Parallel
C 11	Not assigned		
C 12	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 13	Not assigned		
C 14	Cer,(CC924CH1H*J)	100 to 470pF,±5%, 50V	Q'ty 1 to 3,* 330pF
C 15 to C 29	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 30	Elect,(CE04W1A470)	47μF,±20%,10V	
C 31	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 32	Cer,(CC924CH1H221J)	220pF,±5%,50V	
C 33	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 34	Cer,(CC924CH1H331J)	330pF,±5%,50V	
J 1	Connector,(U-PA2219)	22 pins	
J 2	Not assigned		
J 3	Connector,(U-PA2219)	22 pins	
J 4	Not assigned		
J 5	Connector,(U-PA2219)	22 pins	
J 6 to J 94	Not assigned		
J 95	Connector, (HIF23A-16D-AA20S)		
J 96	Not assigned		
J 97	Not assigned		
K 1	Relay,(RL-7141-H138)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF FUNDAMENTAL WAVE GENERATING SECTION Z1

CKT REF	DESCRIPTION	RATING	NOTE
L 1	Microinductor, (LF8-100K)	10μH	
Q 1	Tr,Si,NPN,(2SC372)		
Q 2	Di,breakdown,(RD5.1E)	4.8 to 5.4V,400mW	
Q 3	Tr,Si,NPN,(2SC943)		
Q 4	IC,(HD10125)		
Q 5	Di,Si,(1S953)		
Q 6	Di,Si,(1S953)		
Q 7	Di,Si,(1S953)		
Q 8	Not assigned		
Q 9	Di,Si,(1S953)		
Q 10	Di,Si,(1S953)		
Q 11	Di,Si,(1S953)		
Q 12	Di,Si,(1S953)		
Q 13	Di,Si,(1S953)		
Q 14	Di,Si,(1S953)		
Q 15	Di,Si,(1S953)		
Q 16	Di,Si,(1S953)		
Q 17	Not assigned		
Q 18	Not assigned		
Q 19	Not assigned		
Q 20	Not assigned		
Q 21	IC,(74LS74A)		MG311B1/B2
Q 22	IC,(74LS151)		
Q 23	IC,(74LS161A)		
Q 24	IC,(74LS138)		
Q 25	IC,(74LS279)		
Q 26	IC,(74LS00)		
Q 27	IC,(74LS04)		
Q 28	IC,(74LS157)		
Q 29	IC,(74LS174)		
Q 30	IC,(74LS174)		
Q 31	IC,(74LS00)		
Q 32	Not assigned		
Q 33	IC,(74LS123)		
Q 34	IC,(HN462716)		
Q 35	IC,(74LS10)		
Q 36	IC,(74LS74A)		
Q 37	IC,(74LS04)		
Q 38	IC,(74LS04)		MG311B1
Q 39	IC,(74LS30)		
Q 40	IC,(74LS04)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF FUNDAMENTAL WAVE GENERATING SECTION Z1

KT EF	DESCRIPTION	RATING		NOTE
41	IC,(74LS123)			
42	IC,(74LS10)			
43	IC,(74LS85)			
44	IC,(74LS85)			
45	IC,(74LS85)			
46	IC,(74LS10)			
47	IC,(74LS08)			
48	IC,(74LS193)			
49	IC,(74LS193)			
50	IC,(74LS193)			
51	IC,(74LS00)			
52	IC,(74LS00)			
53	IC,(74LS00)			
54	IC,(74LS08)			
55	IC,(74LS08)			
56	IC,(74LS08)			
57	IC,(74LS04)			
58	IC,(74LS174)			
59	IC,(74LS174)			
60	IC,(74LS174)			
61	IC,(μPB425D)			
62	IC,(μPB425D)			
63	IC,(74LS74A)			
64	IC,(74LS04)			
65	IC,(74LS293)			
66	IC,(74LS293)			
67	IC,(74LS85)			
68	IC,(74LS85)			
69	IC,(74LS00)			
70	IC,(74LS157 or 74S157)			
71	IC,(74LS08 or 74S08)			
72	IC,(74LS293)			}MG311B1/B2
73	IC,(74LS293)			
74	IC,(74LS161A)			
75	IC,(74LS161A)			MG311B1/B2
76	IC,(74S10)			
R 1	Single in-line array, (IHR-8-123JA)	12kΩ×8,1/8W		
R 2	Single in-line array, (IHR-7-333JA)	33kΩ×7,1/8W		
R 3	Single in-line array, (IHR-6-333JA)	33kΩ×6,1/8W		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF LEVEL ADJUSTING SECTION Z2

CKT REF	DESCRIPTION	RATING	NOTE
C 31	Cer,(CC924CH1H151J)	150pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H150J)	15pF,±5%,50V	MG311B1
C 32	Cer,(CC924CJ1H220C)	22pF,±0.25pF,50V	MG311B/B2
	Cer,(CC924CJ1H030C)	3pF,±0.25pF,50V	MG311B1
C 33	Cer,(CC924CH1H470J)	47pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H330J)	33pF,±5%,50V	MG311B1
C 34	Cer,(CC924CJ1H020C)	2pF,±0.25pF,50V	MG311B/B2
	Cer,(CC924CJ1H030C)	3pF,±0.25pF,50V	MG311B1
C 35	Cer,(CC924CH1H680J)	68pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H330J)	33pF,±5%,50V	MG311B1
C 36	Cer,(CC924CH1H040J)	4pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H150J)	15pF,±5%,50V	MG311B1
C 37	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V	MG311B1
C 38	Cer,(CC924CH1H470J)	47pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H220J)	22pF,±5%,50V	MG311B1
C 39	Cer,(CC924CH1H070J)	7pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H220J)	22pF,±5%,50V	MG311B1
C 40	Cer,(CC924CH1H090D)	9pF,±0.5pF,50V	MG311B/B2
C 41	Cer,(CC924CH1H330J)	33pF,±5%,50V	
C 42	Cer,(CC924CH1H220J)	22pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H150J)	15pF,±5%,50V	MG311B1
C 43	Cer,(CC924CJ1H040C)	4pF,±0.25pF,50V	MG311B/B2
	Cer,(CC924CJ1H030C)	3pF,±0.25pF,50V	MG311B1
C 44	Cer,(CC924CH1H470J)	47pF,±5%,50V	MG311B/B2
	Cer,(CC924CH1H330J)	33pF,±5%,50V	MG311B1
C 45	Cer,(CC924CH1H150D)	15pF,±0.5pF,50V	MG311B/B2
	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V	MG311B1
C 46	Cer,(CC924CH1H220D)	22pF,±0.5pF,50V	MG311B/B2
	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V	MG311B1
C 47	Cer,(RD340CK010CY50)	1pF,±0.25pF,50V	MG311B1
C 48	Cer,(CK924C1H104M)	0.1μF,±20%,50V	Q'ty 1 to 3,* 0.3μF
C 49	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 50	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 51	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 52	Elect,(CE04W1E470)	47μF,±20%,25V	
C 53	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 54	Elect,(CE04W1E470)	47μF,±20%,25V	
C 55	Elect,(CE04W1E101)	100μF,±20%,25V	
C 56	Elect,(CE04W1E101)	100μF,±20%,25V	
C 57	Elect,(CE04W1A470)	47μF,±20%,10V	
C 58	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 59	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 60	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 61	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 62	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 63	Cer,(CC924CH1H101J)	100pF,±5%,50V	MG311B1
C 64	Elect,(CE04W1E101)	100μF,±20%,25V	
C 65	Elect,(CE04W1A101)	100μF,±20%,10V	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF LEVEL ADJUSTING SECTION Z2

CKT REF	DESCRIPTION	RATING	NOTE
C 66	Elect,(CE04W1A101)	100μF,±20%,10V	
C 67	Cer,(CC924CH1H150J)	15pF,±5%,50V	
C 68	Elect,(CE04W1E101)	100μF,±20%,25V	
C 69	Elect,(CE04W1E101)	100μF,±20%,25V	
C 70	Elect,(CE04W1E101)	100μF,±20%,25V	
C 71	Elect,(CE04W1E101)	100μF,±20%,25V	
J 1	Not assigned		
J 2	Not assigned		
J 3	Not assigned		
J 4	Not assigned		
J 5	Not assigned		
J 6	Not assigned		
J 7	Connector,(U-PA2219)	22 pins	
J 8	Not assigned		
J 9	Connector,(U-PA2219)	22 pins	
J 10 to J 43	Not assigned		
J 44	Connector,(PI011-2M)		
J 45	Not assigned		
J 46	Connector,(PI011-2M)		
J 47	Not assigned		
J 48	Connector,(PI011-2M)		
J 49 to J 89	Not assigned		
J 90	Connector,(PI011-2M)		
J 91	Not assigned		
J 92	Not assigned		
J 93	Not assigned		
J 94	Not assigned		
J 95	Not assigned		
J 96	Not assigned		
J 97	Not assigned		
J 98	Not assigned		
J 99	Connector,(U-PA2219)	22 pins	
K 1	Relay,(RL-7141-H138)		
K 2	Relay,(NR-HD-12V)		
K 3	Relay,(RL-7141-H138)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF LEVEL ADJUSTING SECTION Z2

CKT REF	DESCRIPTION	RATING	NOTE
L 1	Coil,(34L17630)	20μH	
L 2	Microinductor, (LF8-100K)	10μH	
L 3	Coil,(34L17630)	20μH	
L 4	Coil,(439T14923A)	15.9μH	MG311B/B2
	Coil,(439T14923A)	12.75μH	MG311B1
L 5	Coil,(439T14923B)	6.3μH	MG311B/B2
	Coil,(439T14923B)	5.04μH	MG311B1
L 6	Coil,(439T14923C)	6.5μH	MG311B/B2
	Coil,(439T14923C)	5.23μH	MG311B1
L 7	Coil,(439T14923D)	7.8μH	MG311B/B2
	Coil,(439T14923D)	6.25μH	MG311B1
L 8	Coil,(439T14923E)	31.9μH	MG311B/B2
	Coil,(439T14923E)	25.5μH	MG311B1
L 9	Coil,(439T14923F)	12.6μH	MG311B/B2
	Coil,(439T14923F)	10.07μH	MG311B1
L 10	Coil,(439T14923G)	13.1μH	MG311B/B2
	Coil,(439T14923G)	10.46μH	MG311B1
L 11	Coil,(439T14923H)	15.6μH	MG311B/B2
	Coil,(439T14923H)	12.5μH	MG311B1
Q 1	Tr,Si,NPN,(2SH24)		
Q 2	Di,Si,(1S953)		
Q 3	Di,Si,(1S953)		
Q 4	Tr,Si,PNP,(2SA603)		
Q 5	Tr,Si,PNP,(2SA603)		
Q 6	Tr,Si,PNP,(2SA603)		
Q 7	Tr,Si,PNP,(2SA603)		
Q 8	Tr,Si,PNP,(2SA603)		
Q 9	Tr,Si,PNP,(2SA603)		
Q 10	Di,Si,(1S953)		
Q 11	Tr,Si,PNP,(2SA603)		
Q 12	Tr,Si,PNP,(2SA603)		
Q 13	Di,Si,(1S953)		
Q 14	Tr,Si,PNP,(2SA603)		
Q 15	Tr,Si,PNP,(2SA603)		
Q 16	Tr,Si,NPN,(2SC1833)		
Q 17	Tr,Si,PNP,(2SA603)		
Q 18	Tr,Si,NPN,(2SC1833)		
Q 19	Tr,Si,PNP,(2SA603)		
Q 20	Tr,Si,NPN,(2SC31)		
Q 21	Tr,Si,PNP,(2SA711)		
Q 22	Tr,Si,NPN,(2SC31)		
Q 23	Tr,Si,PNP,(2SA711)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF LEVEL ADJUSTING SECTION Z2

KT EF	DESCRIPTION	RATING	NOTE
24	Tr,Si,NPN,(2SC31)		
25	Tr,Si,PNP,(2SA711)		
26	Tr,Si,PNP,(2SA711)		
27	Di,Si,(1S953)		
28	Tr,Si,PNP,(2SA603)		MG311B1
29	Not assigned		
30	IC,(74LS08)		
31	IC,(74LS10)		
32	IC,(74LS20)		
33	IC,(74LS04)		
34	IC,(74LS10)		
35	IC,(74LS00)		
36	IC,(74LS20)		
37	IC,(74LS00)		
38	IC,(74LS00)		
39	IC,(74LS08)		
40	IC,(74LS04)		
41	IC,(74LS04)		
42	IC,(74LS30)		
43	Not assigned		
44	IC,(74LS20)		
45	IC,(7406)		
46	IC,(74LS10)		
47	IC,(74LS10)		
48	IC,(74LS10)		
49	IC,(74LS74A)		
50	IC,(74LS10)		
51	IC,(74LS32)		
52	IC,(74LS74A)		
R 1	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 2	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W	
R 3	CF,(ARD25T470J)	47Ω,±5%,1/4W	
R 4	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 5	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 6	Not assigned		
R 7	Single in-line array, (IHR-9-333JA)	33kΩ×9,1/8W	
R 8	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 9	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 10	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	MG311B1

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF LEVEL ADJUSTING SECTION Z2

CKT REF	DESCRIPTION	RATING	NOTE
R 11	CF,(ARD25T471J)	470Ω,±5%,1/4W	MG311B1
R 12	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	MG311B1
R 13	CF,(ARD25T473J)	47kΩ,±5%,1/4W	MG311B1
R 14	CF,(ARD25T102J)	1kΩ,±5%,1/4W	MG311B1
R 15	Not assigned		
R 16	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 17	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 18	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 19	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 20	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 21	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 22	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 23	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 24	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 25	CF,(ARD25T681J)	680Ω,±5%,1/4W	
R 26	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 27	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 28	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 29	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 30	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 31	Not assigned		
R 32	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 33	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 34	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 35	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 36	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 37	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 38	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 39	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 40	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 41	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 42	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 43	CF,(ARD25T*J)	6.8k to 150kΩ,±5%, 1/4W	Q'ty 1 to 3,* 10kΩ
R 44	CF,(ARD25T220J)	22Ω,±5%,1/4W	
R 45	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 46	CF,(ARD25T201J)	200Ω,±5%,1/4W	MG311B
	CF,(ARD25T181J)	180Ω,±5%,1/4W	MG311B1
R 47	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 48	CF,(ARD25T*J)	6.8k to 150kΩ,±5%, 1/4W	Q'ty 1 to 3,* 12kΩ
R 49	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 50	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 51	CF,(ARD25T220J)	22Ω,±5%,1/4W	
R 52	CF,(ARD25T201J)	200Ω,±5%,1/4W	
R 53	Not assigned		
R 54	Not assigned		
R 55	Not assigned		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF LEVEL ADJUSTING SECTION Z2

CKT REF	DESCRIPTION	RATING	NOTE
R 56	Not assigned		
R 57	Not assigned		
R 58	Not assigned		
R 59	CF,(ARD25T*J)	680Ω to 10kΩ,±5%, 1/4W.	Q'ty 1 to 3,* 820Ω, 8.2kΩ Parallel
R 60	CF,(ARD25T*J)	680Ω to 10kΩ,±5%, 1/4W	Q'ty 1 to 3,* 820Ω
R 61	MF,(RN14K1E4220D)	422Ω,±0.5%,1/2W	
R 62	Var,MF,(RJ-6P 100Ω)	100Ω,1/2W	
R 63	CF,(ARD25T391J)	390Ω,±5%,1/4W	
R 64	CF,(ARD25T100J)	10Ω,±5%,1/4W	
R 65	CF,(ARD25T*J)	330Ω to 4.7k ,±5%, 1/4W	Q'ty 1 to 3,* 470Ω, 3.3kΩ Parallel
R 66	MF,(RN14K1E4220D)	422Ω,±0.5%,1/2W	
R 67	Var,MF,(RJ-6P 100)	100Ω,1/2W	
R 68	CF,(ARD25T391J)	390Ω,±5%,1/4W	
R 69	CF,(ARD25T100J)	10Ω,±5%,1/4W	
R 70	CF,(ARD25T*J)	330Ω to 4.7kΩ,±5%, 1/4W	Q'ty 1 to 3,* 470Ω, 3.3kΩ Parallel
R 71	CF,(ARD25T601J)	600Ω,±5%,1/4W	
R 72	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 73	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 74	CF,(ARD25T*J)	470Ω to 8.2kΩ,±5%, 1/4W	Q'ty 1 to 3,* 600Ω
R 75	Not assigned		
R 76	CF,(ARD25T*J)	4.7 to 100Ω,±5%, 1/4W	Q'ty 1 to 3,* 6.8Ω, 10Ω Parallel
R 77	CF,(ARD25T820J)	82Ω,±5%,1/4W	
R 78	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 79	Not assigned		
R 80	Not assigned		
R 81	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 82	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 83	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 84	CF,(ARD25T*J)	6.8k to 150kΩ,±5%, 1/4W	Q'ty 1 to 3,* 10kΩ
R 85	CF,(ARD25T220J)	22Ω,±5%,1/4W	
R 86	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 87	CF,(ARD25T101J)	100Ω,±5%,1/4W	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF LEVEL ADJUSTING SECTION Z2

CKT REF	DESCRIPTION	RATING	NOTE
R 88	CF,(ARD25T*J)	270Ω to 4.7kΩ,±5%, 1/4W	Q'ty 1 to 3,* 470Ω, 3.3kΩ Parallel MG311B/B2
	CF,(ARD25T301J)	300Ω,±5%,1/4W	MG311B1
R 89	CF,(ARD25T*J)	6.8k to 150kΩ,±5%, 1/4W	Q'ty 1 to 3,* 12kΩ
R 90	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 91	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 92	CF,(ARD25T*J)	270Ω to 47kΩ,±5%, 1/4W	Q'ty 1 to 3,* 470Ω, 3.3kΩ Parallel MG311B/B2
	CF,(ARD25T301J)	300Ω,±5%,1/4W	MG311B1
R 93	CF,(ARD25T220J)	22Ω,±5%,1/4W	
R 94	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 95	CF,(ARD25T681J)	680Ω,±5%,1/4W	
R 96	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 97	CF,(ARD25T271J)	270Ω,±5%,1/4W	
R 98	CF,(ARD25T271J)	270Ω,±5%,1/4W	
R 99	CF,(ARD25T220J)	22Ω,±5%,1/4W	
R 100	CF,(ARD25T*J)	330Ω to 4.7kΩ,±5%, 1/4W	Q'ty 1 to 3,* 470Ω, 3.3kΩ Parallel
R 101	Not assigned		
R 102	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 103	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 104	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 105	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 106	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 107	CF,(ARD25T333J)	33kΩ,±5%,1/4W	MG311A1
R 108	CF,(ARD25T*J)	120Ω to 2.2kΩ,±5%, 1/4W	Q'ty 1 to 3,* 180Ω
R 109	CF,(ARD25T333J)	33kΩ,±5%,1/4W	MG311B1
R 110	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W	
R 111	CF,(ARD25T221J)	220Ω,±5%,1/4W	
R 112	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 113	CF,(ARD25T100J)	10Ω,±5%,1/4W	
R 114	CF,(ARD25T100J)	10Ω,±5%,1/4W	
R 115	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 116	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
S 1	Dip,(DIP-A8)		
S 2	Dip,(DIP-A4)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF SUBCARRIER GENERATING SECTION Z3

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Elect,(CE04W1E101)	100μF,±20%,25V	
C 2	Elect,(CE04W1E101)	100μF,±20%,25V	
C 3	Elect,(CE04W1E101)	100μF,±20%,25V	
C 4	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 5	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 6	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 7	Tant,(CS02H1V010M)	1μF,±20%,35V	
C 8	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 9	Cer,(CC924CH1H471J)	470pF,±5%,50V	Parallel
	Cer,(CC924CH1H*J)	15 to 150pF,±5%,50V	Q'ty 1 to 3,* 15pF
C 10	Cer,(CC924CH1H*J)	150 to 470pF,±5%, 50V	Q'ty 1 to 3,* 150pF
	Cer,(CC924CH1H151J)	150pF,±5%,50V	Parallel Q'ty 1 to 3, MG311A
	Cer,(CC924CH1H180J)	18pF,±5%,50V	MG311A1
C 11	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 12	Cer,(CC924CH1H*J)	22 to 100pF,±5%,50V	Q'ty 1 to 3,* 100pF
C 13	Cer,(CC924CH1H*J)	100 to 470pF,±5%, 50V	Q'ty 1 to 3,* 100pF
C 14	Cer,(CK924C1H103M)	0.01μF,±20%,50V	
C 15	Cer,(CK924C1H103M)	0.01μF,±20%,50V	
C 16	Cer,(CK924C1H103M)	0.01μF,±20%,50V	
C 17	Not assigned		
C 18	Not assigned		
C 19	Cer,(CK924C1H103M)	0.01μF,±20%,50V	
C 20	Elect,(CE04W1V220)	22μF,±20%,35V	OP-02
C 21	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 22	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 23	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 24	Cer,(CC924CH1H151J)	150pF,±5%,50V	MG311B1
C 25	Cer,(CC924CH1H101J)	100pF,±5%,50V	OP-02
C 26	Cer,(CC924CH1H220J)	22pF,±5%,50V	
C 27	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 28	Cer,(CC924CH1H**)	4 to 15pF,±0.5pF to ±5%,50V	* 12pF
C 29	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 30	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 31	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 32	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 33	Cer,(CK924C1H104M)	0.1μF,±20%,50V	OP-02
C 34	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 35	Cer,(CK924C1H222M)	2200pF,±20%,50V	
C 36	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 37	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 38	Cer,(CC924CH1H331J)	330pF,±5%,50V	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF SUBCARRIER GENERATING SECTION Z3

CKT REF	DESCRIPTION	RATING	NOTE
C 39	Cer,(CK924C1H222M)	2200pF,±20%,50V	OP-02
C 40	Tant,(CS02H1V010M)	1μF,±20%,35V	OP-02
C 41	Cer,(CK924C1H102M)	1000pF,±20%,50V	OP-02
C 42	Cer,(CC924CH1H*J)	15 to 100pF,±5%,50V	OP-02 Q'ty 0 or 1,* 47pF
C 43	Cer,(CC924CH1H101J)	100pF,±5%,50V	OP-02
J 1 to J 28	Not assigned		
J 29	Connector,(U-PA2219)	22 pins	
J 30 to J 41	Not assigned		
J 42	Connector,(PI021-2M)		
J 43 to J 59	Not assigned		
J 60	Connector,(PI021-2M)		
J 61	Not assigned		
J 62	Not assigned		
J 63	Not assigned		
J 64	Not assigned		
J 65	Not assigned		
J 66	Not assigned		
J 67	Not assigned		
J 68	Not assigned		
J 69	Connector,(PI021-2M)		
J 70 to J 110	Not assigned		
J 111	Connector,(PI021-2M)		
K 1	Relay,(NR-SD-12V)		
K 2	Relay,(NR-SD-12V)		
K 3	Relay,(RL-7141-H138)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF SUBCARRIER GENERATING SECTION Z3

CKT REF	DESCRIPTION	RATING	NOTE
L 1	Microinductor, (LF8-100K)	10μH	
L 2	Microinductor, (LF8-100K)	10μH	
L 3	Microinductor, (LF8-100K)	10μH	
L 4	Microinductor, (LV1-4R7)	4.7μH	
L 5	Microinductor, (LV1-4R7)	4.7μH	
L 6	Microinductor, (LV1-100K)	10μH	
L 7	Microinductor, (LF8-100K)	10μH	
Q 1	IC,(7407)		
Q 2	IC,(7406)		OP-02
Q 3	IC,(74LS04)		
Q 4	IC,(74LS00)		
Q 5	IC,(74LS00)		
Q 6	IC,(7474A)		
Q 7	Di,Si,(1S953)		
Q 8	Di,Si,(1S953)		
Q 9	Tr,Si,NPN,(2SC943)		
Q 10	Tr,Si,NPN,(2SC943)		
Q 11	Tr,Si,NPN,(2SC97)		
Q 12	Tr,Si,NPN,(2SC943)		
Q 13	Tr,Si,NPN,(2SC943)		
Q 14	Tr,Si,NPN,(2SC943)		
Q 15	Tr,Si,NPN,(2SC943)		
Q 16	Tr,Si,NPN,(2SC943)		
Q 17	Not assigned		
Q 18	Not assigned		
Q 19	Not assigned		
Q 20	Not assigned		
Q 21	IC,(74LS123)		MG311B1/B2 OP-02
Q 22	IC,(74LS74A)		MG311B1/B2 OP-02
Q 23	IC,(TC4066BP)		OP-02
Q 24	IC,(μPC91A)		MG311B1/B2 OP-02
Q 25	Tr,Si,NPN,(2SC943)		OP-02

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF SUBCARRIER GENERATING SECTION Z3

CKT REF	DESCRIPTION	RATING	NOTE
Q 26	Tr,Si,NPN,(2SC943)		MG311B1/B2 OP-02
Q 27	Tr,Si,NPN,(2SC943)		
Q 28	Di,Si,(1S953)		
Q 29	Tr,Si,NPN,(2SC943)		
Q 30	Tr,Si,NPN,(2SC372)		
Q 31	Di,varicap,(FC54)		
Q 32	IC,(HD10125)		
Q 33	Di,breakdown,(RD5.1E)	4.8 to 5.7V,400mW	
Q 34	Tr,Si,NPN,(2SC943)		OP-02
Q 35	IC,(MC1496P)		
Q 36	Tr,Si,NPN,(2SC943)		
Q 37	IC,(μPC251C)		
Q 38	Di,breakdown,(RD7.5E)	7.0 to 8.4V,400mW	
R 1	CF,(ARD25T*J)	1k to 33kΩ,±5%,1/4W	Q'ty 1 to 3,* 1.8kΩ Parallel
R 2	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 3	CF,(ARD25T680J)	68Ω,±5%,1/4W	
R 4	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W	
R 5	CF,(ARD25T*J)	180Ω to 2.2kΩ,±5%, 1/4W	Q'ty 1 to 3,* 220Ω, 2.2kΩ Parallel
R 6	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 7	MF,(RN14K2H221J)	220Ω,±5%,1/2W	
R 8	Not assigned		
R 9	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W	
R 10	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W	
R 11	CF,(ARD25T750J)	75Ω,±5%,1/4W	
R 12	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W	
R 13	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 14	CF,(ARD25T391J)	390Ω,±5%,1/4W	
R 15	CF,(ARD25T391J)	390Ω,±5%,1/4W	
R 16	CF,(ARD25T391J)	390Ω,±5%,1/4W	
R 17	CF,(ARD25T391J)	390Ω,±5%,1/4W	
R 18	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W	
R 19	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W	
R 20	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 21	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 22	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 23	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 24	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 25	CF,(ARD25T102J)	1kΩ,±5%,1/4W	

( ) : Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF SUBCARRIER GENERATING SECTION Z3

CKT REF	DESCRIPTION	RATING	NOTE
R 26	CF,(ARD25T*J)	680Ω to 12kΩ,±5%, 1/4W	Q'ty 1 to 3,* 560Ω
R 27	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W	
R 28	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 29	CF,(ARD25T220J)	22Ω,±5%,1/4W	
R 30	CF,(ARD25T680J)	68Ω,±5%,1/4W	
R 31	MF,(RN14K2H221J)	220Ω,±5%,1/2W	
R 32	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 33	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 34	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W	
R 35	Not assigned		
R 36	Not assigned		
R 37	Not assigned		
R 38	Not assigned		
R 39	CF,(ARD25T102J)	1kΩ,±5%,1/4W	MG311B1/B2 OP-02
R 40	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 41	CF,(ARD25T103J)	10kΩ,±5%,1/4W	OP-02
R 42	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W	OP-02
R 43	CF,(ARD25T102J)	1kΩ,±5%,1/4W	OP-02
R 44	CF,(ARD25T102J)	1kΩ,±5%,1/4W	MG311B1/B2 OP-02
R 45	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 46	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 47	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 48	CF,(ARD25T*J)	100 to 330Ω,±5%,50V	Q'ty 1 to 3,* 270Ω
R 49	CF,(ARD25T330J)	33Ω,±5%,1/4W	
R 50	CF,(ARD25T183J)	18kΩ,±5%,1/4W	
R 51	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W	
R 52	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 53	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 54	CF,(ARD25T223J)	22kΩ,±5%,1/4W	MG311B1/B2 OP-02
R 55	CF,(ARD25T223J)	22kΩ,±5%,1/4W	
R 56	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 57	CF,(ARD25T*J)	1k to 10kΩ,±5%,1/4W	Q'ty 1 to 3,* 5.6kΩ
R 58	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 59	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 60	CF,(ARD25T223J)	22kΩ,±5%,1/4W	
R 61	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 62	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 63	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 64	CF,(ARD25T103J)	10kΩ,±5%,1/4W	OP-02
R 65	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 66	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W	
R 67	CF,(ARD25T*J)	180Ω to 10kΩ,±5%, 1/4W	Q'ty 1 to 3,* 680Ω

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF SUBCARRIER GENERATING SECTION Z3

CKT REF	DESCRIPTION	RATING	NOTE
R 68	CF,(ARD25T*J)	820Ω to 10kΩ,±5%, 1/4W	Q'ty 1 to 3,* 1kΩ, 10kΩ Parallel
R 69	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 70	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 71	CF,(ARD25T331J)	330Ω,±5%,1/4W	
R 72	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W	
R 73	CF,(ARD25T331J)	330Ω,±5%,1/4W	
R 74	CF,(ARD25T*J)	3.3k to 100kΩ,±5%, 1/4W	Q'ty 1 to 3,* 6.8kΩ
R 75	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W	
R 76	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W	
R 77	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W	
R 78	CF,(ARD25T683J)	68kΩ,±5%,1/4W	OP-02
R 79	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 80	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 81	CF,(ARD25T563J)	56kΩ,±5%,1/4W	
R 82	CF,(ARD25T*J)	8.2k to 33kΩ,±5%, 1/4W	Q'ty 1 to 3,* 22kΩ
R 83	CF,(ARD25T105J)	1MΩ,±5%,1/4W	Q'ty 2 Series
R 84	CF,(ARD25T153J)	15kΩ,±5%,1/4W	
R 85	CF,(ARD25T153J)	15kΩ,±5%,1/4W	
R 86	CF,(ARD25T*J)	1k to 33kΩ,±5%,1/4W	Q'ty 1 to 3,* 1.8k Parallel
R 87	CF,(ARD25T121J)	120Ω,±5%,1/4W	
R 88	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
X 1	XTAL OSC,(44X68792)	7159.09kHz	MG311B
	XTAL OSC,(44X68792)	8867.2kHz	MG311B1
	XTAL OSC,(44X68792)	7151.223kHz	MG311B2

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF OUTPUT SECTION Z4

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 2	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 3	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 4	Elect,(CE04W1E101)	100μF,±20%,25V	
C 5	Elect,(CE04W1A470)	47μF,±20%,10V	
C 6	Elect,(CE04W1E101)	100μF,±20%,25V	
C 7	Not assigned		
C 8	Cer,(CC924CH1H120J)	12pF,±5%,50V	
C 9	Cer,(CC924CH1H360J)	36pF,±5%,50V	
C 10	Tant,(CS-E1V010M)	1μF,±20%,35V	
C 11	Cer,(CC924CH1H680J)	68pF,±5%,50V	}Parallel
	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 12	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 13	Cer,(CC924CH1H151J)	150pF,±5%,50V	
C 14	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 15	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 16	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 17	Elect,(CE04W1E101)	100μF,±20%,25V	
C 18	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 19	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 20	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 21	Cer,(CK924C1H222M)	2200pF,±20%,50V	
C 22	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 23	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 24	Cer,(CC924CH1H151J)	150pF,±5%,50V	
C 25	Cer,(CC924CH1H240J)	24pF,±5%,50V	
C 26	Cer,(CC924CH1H150J)	15pF,±5%,50V	
C 27	Elect,(CE04W1E101)	100μF,±20%,25V	
C 28	Elect,(CE04W1E101)	100μF,±20%,25V	
C 29	Cer,(CC924CH1H101J)	100pF,±5%,50V	
C 30	Not assigned		
C 31	Elect,(CE04W1A221)	220μF,±20%,10V	OP-02
C 32	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 33	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 34	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 35	Cer,(CK924C1H222M)	2200pF,±20%,50V	
C 36	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 37	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 38	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 39	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 40	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 41	Cer,(CK924C1H222M)	2200pF,±20%,50V	
C 42	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 43	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 44	Cer,(CC924CH1H680J)	68pF,±5%,50V	

( ) : Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF OUTPUT SECTION Z4

CKT REF	DESCRIPTION	RATING	NOTE
C 45	Cer,(CC924CH1H030C) Cer,(CC924CH1H*D)	3pF,±0.25pF,50V 4 to 10pF,±0.5pF, 50V	Q'ty 0 to 3,* 3pF
C 46	Cer,(CC924CH1H680J)	68pF,±5%,50V	OP-02
C 47	Cer,(CC924CH1H680J)	68pF,±5%,50V	
C 48	Cer,(CC924CH1H*J)	22 to 68pF,±5%,50V	Q'ty 0 to 3,* 39pF
C 49	Cer,(CC924CH1H680J)	68pF,±5%,50V	
C 50	Cer,(CC924CH1H101J)	100pF,±5%,50V	
C 51	Cer,(CC924CH1H101J)	100pF,±5%,50V	
C 52	Not assigned		
J 1 to J 30	Not assigned		
J 31	Connector,(U-PA2219)	22 pins	
J 32 to J 49	Not assigned		
J 50	Connector,(PI011-2M)		
J 51	Not assigned		
J 52	Not assigned		
J 53	Not assigned		
J 54	Receptacle, (27DP-LR-PC)		
J 55 to J 91	Not assigned		
J 92	Connector,(PI011-2M)		
J 93	Not assigned		
J 94	Not assigned		
J 95	Not assigned		
J 96	Not assigned		
J 97	Not assigned		
J 98	Not assigned		
J 99	Not assigned		
J 100	Not assigned		
J 101	Not assigned		
J 102	Connector,(PI011-2M)		OP-02
J 103 to J 113	Not assigned		
J 114	Connector,(PI011-2M)		
J 115	Not assigned		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF OUTPUT SECTION Z4

CKT REF	DESCRIPTION	RATING	NOTE
J 116	Receptacle, (27DP-LR-PC)		
J 117	Not assigned		
J 118	Receptacle, (27DP-LR-PC)		
J 119	Not assigned		
J 120	Receptacle, (27DP-LR-PC)		
J 121	Not assigned		
J 122	Receptacle, (27DP-LR-PC)		OP-02
K 1	Relay, (NR-HD-12V)		OP-02
K 2	Relay, (NR-HD-12V)		
K 3	Relay, (NR-HD-12V)		
K 4	Relay, (NR-HD-12V)		
L 1	Coil, (34L17630)	20μH	
L 2	Microinductor, (LF8-100K)	10μH	
L 3	Coil, (34L17630)	20μH	
L 4	Coil, (SP0408-R47K)	0.47μH	
L 5	Microinductor, (LF8-101K)	100μH	
L 6	Microinductor, (LF8-101K)	100μH	OP-02
L 7	Microinductor, (LF8-101K)	100μH	OP-02
Q 1	IC, (μPC107A)		
Q 2	Tr, Si, PNP, (2SA708)		
Q 3	Tr, Si, NPN, (2SC97)		
Q 4	Tr, Si, NPN, (2SC97)		
Q 5	IC, (CA3080)		
Q 6	IC, (μPC151C)		
Q 7	IC, (74LS00)		
Q 8	IC, (74LS123)		
Q 9	IC, (7406)		
Q 10	Di, Si, (1S953)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF OUTPUT SECTION Z4

CKT REF	DESCRIPTION	RATING	NOTE
Q 11	Tr,Si,PNP,(2SA603)		
Q 12	Not assigned		
Q 13	Not assigned		
Q 14	Not assigned		
Q 15	Not assigned		
Q 16	Tr,Si,NPN,(2SC1010)		
Q 17	Tr,Si,PNP,(2SA708)		
Q 18	Tr,Si,NPN,(2SC943)		
Q 19	Tr,Si,NPN,(2SC97)		
Q 20	IC,(μPC91A)		
Q 21	Tr,Si,NPN,(2SC97)		
Q 22	Tr,Si,PNP,(2SA708)		
Q 23	Tr,Si,NPN,(2SC1010)		
Q 24	IC,(μPC151C)		
Q 25	IC,(CA3080)		
Q 26	Di,Si,(1S953)		
Q 27	Di,Si,(1S953)		
Q 28	Di,Si,(1S953)		
Q 29	Di,Si,(1S953)		
Q 30	IC,(7407)		OP-02
Q 31	IC,(μPC151C)		
Q 32	IC,(CA3080)		
Q 33	Tr,Si,PNP,(2SA708)		
Q 34	Tr,Si,NPN,(2SC97)		
Q 35	IC,(μPC91A)		
Q 36	Tr,Si,NPN,(2SC97)		
Q 37	Tr,Si,PNP,(2SA708)		
Q 38	Tr,Si,NPN,(2SC1275)		
Q 39	Tr,Si,NPN,(2SC1275)		
Q 40	Tr,Si,NPN,(2SC1275)		
Q 41	Tr,Si,NPN,(2SC1275)		
Q 42	Tr,Si,PNP,(2SA708)		
Q 43	Di,breakdown,(RD6.2E)	5.8 to 6.6V,400mW	
R 1	CF,(ARD25T221J)	220Ω,±5%,1/4W	
R 2	Var,MF,(RJ-6P 100Ω)	100Ω,1/2W	
R 3	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 4	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 5	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 6	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 7	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 8	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 9	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 10	CF,(ARD25T*J)	68 to 820Ω,±5%,1/4W	Q'ty 1 to 3,* 82Ω

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF OUTPUT SECTION Z4

CKT REF	DESCRIPTION	RATING	NOTE
R 11	CF,(RD1/4PX 8.66ΩF)	8.66Ω,±1%,1/4W	
R 12	MF,(RN14K2E1301D)	1.30kΩ,±0.5%,1/4W	
R 13	MF,(RN14K2E1301D)	1.30kΩ,±0.5%,1/4W	
R 14	CF,(ARD25T470J)	47Ω,±5%,1/4W	
R 15	CF,(ARD25T821J)	820Ω,±5%,1/4W	
R 16	CF,(ARD25T820J)	82Ω,±5%,1/4W	
R 17	MF,(RN14K2E26R7D)	26.7Ω,±0.5%,1/4W	
R 18	CF,(RD1/4PX 439ΩD)	439Ω,±0.5%,1/4W	
R 19	CF,(RD1/4PX 439ΩD)	439Ω,±0.5%,1/4W	
R 20	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 21	MF,(RS1FB 330Ω)	330Ω,1W	
R 22	MF,(RS1FB 330Ω)	330Ω,1W	
R 23	CF,(ARD25T470J)	47Ω,±5%,1/4W	
R 24	CF,(ARD25T821J)	820Ω,±5%,1/4W	
R 25	MF,(RS1FB 330Ω)	330Ω,1W	
R 26	CF,(ARD25T470J)	47Ω,±5%,1/4W	
R 27	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 28	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 29	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 30	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 31	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 32	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	OP-02
R 33	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	OP-02
R 34	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	OP-02
R 35	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 36	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 37	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 38	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 39	MF,(RN14K2E3922D)	39.2kΩ,±0.5%,1/4W	
R 40	MF,(RN14K2E3922D)	39.2kΩ,±0.5%,1/4W	
R 41	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 42	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 43	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 44	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 45	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 46	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 47	CF,(ARD25T561J)	560Ω,±5%,1/4W	Q'ty 0 or 1,* 580Ω No option
R 48	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W	
R 49	Not assigned		
R 50	Not assigned		
R 51	CF,(ARD25T101J)	100Ω,±5%,1/4W	OP-02
R 52	CF,(ARD25T103J)	10kΩ,±5%,1/4W	OP-02
R 53	CF,(ARD25T223J)	22kΩ,±5%,1/4W	OP-02
R 54	MF,(RN14K2E75R0D)	75Ω,±0.5%,1/4W	OP-02
R 55	CF,(ARD25T101J)	100Ω,±5%,1/4W	OP-02

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF OUTPUT SECTION Z4

CKT REF	DESCRIPTION	RATING	NOTE
R 56	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 57	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 58	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 59	CF,(ARD25T561J)	560Ω,±5%,1/4W	
R 60	CF,(ARD25T183J)	18kΩ,±5%,1/4W	
R 61	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 62	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 63	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 64	Var,MF,(RJ-6P 2kΩ)	2kΩ,1/2W	
R 65	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 66	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 67	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 68	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 69	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 70	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 71	CF,(ARD25T103J)	10kΩ,±5%,1/4W	OP-02
R 72	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 73	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 74	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 75	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 76	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 77	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 78	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 79	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 80	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 81	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 82	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 83	CF,(ARD25T221J)	220Ω,±5%,1/4W	
R 84	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 85	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 86	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 87	Not assigned		
R 88	Not assigned		
R 89	Not assigned		
R 90	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 91	CF,(ARD25T104J)	100kΩ,±5%,1/4W	OP-02
R 92	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 93	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 94	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 95	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 96	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 97	MF,(RN14K2E75R0D)	75Ω,±0.5%,1/4W	
R 98	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 99	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 100	CF,(ARD25T101J)	100Ω,±5%,1/4W	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF OUTPUT SECTION Z4

CKT REF	DESCRIPTION	RATING	NOTE
R 101	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 102	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 103	CF,(ARD25T101J)	100Ω,±5%,1/4W	
104	Var,MF,(RJ-6P 2kΩ)	2kΩ,1/2W	
105	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 106	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 107	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 108	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 109	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 110	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 111	MF,(RN14K2H331J)	330Ω,±5%,1/2W	
R 112	MF,(RN14K2H331J)	330Ω,±5%,1/2W	
R 113	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 114	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 115	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 116	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 117	MF,(RN14K2H331J)	330Ω,±5%,1/2W	OP-02
R 118	MF,(RN14K2H331J)	330Ω,±5%,1/2W	
R 119	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 120	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 121	CF,(ARD25T330J)	33Ω,±5%,1/4W	
R 122	CF,(ARD25T331J)	330Ω,±5%,1/4W	
R 123	CF,(ARD25T*J)	120Ω to 1.8kΩ,±5%, 1/4W	Q'ty 1 to 3,* 150Ω
R 124	CF,(ARD25T*J)	390Ω to 8.2kΩ,±5%, 1/4W	Q'ty 1 to 3,* 600Ω
R 125	CF,(ARD25T*J)	390Ω to 8.2kΩ,±5%, 1/4W	Q'ty 1 to 3,* 600Ω
R 126	CF,(ARD25T*J)	120Ω to 1.8kΩ,±5%, 1/4W	Q'ty 1 to 3,* 150Ω
R 127	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 128	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 129	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 130	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W	
R 131	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 132	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF WAVEFORM CONTROL SECTION (OP-01) Z5

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 2	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 3	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 4	Not assigned		
C 5	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 6	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 7	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 8	Elect,(CE04W1A470)	47μF,±20%,10V	
C 9	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 10	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 11	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 12	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 13	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 14	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 15	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 16	Elect,(CE04W1A470)	47μF,±20%,10V	
C 17	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 18	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 19	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 20	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 21	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 22	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 23	Cer,(CK924C1H*M)	1000pF to 0.1μF, ±20%,50V	Q'ty 1 to 3,* MG311B/B2 Open MG311B1 0.047μF, 4700pF Parallel
C 24	Elect,(CE04W1V4R7)	4.7μF,±20%,35V	
C 25	Not assigned		
C 26	Not assigned		
C 27	Not assigned		
C 28	Not assigned		
C 29	Not assigned		
C 30	Not assigned		
C 31	Not assigned		
C 32	Not assigned		
C 33	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 34	Not assigned		
C 35	Not assigned		
C 36	Not assigned		
C 37	Not assigned		
C 38	Not assigned		
C 39	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 40	Cer,(CK924C1H104M)	0.1μF,±20%,50V	

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING	NOTE
C 41	Not assigned		
C 42	Cer,(CC924CH1H471J)	470pF,±5%,50V	
J 1	Not assigned		
J 2	Not assigned		
J 3	Not assigned		
J 4	Not assigned		
J 5	Not assigned		
J 6	Not assigned		
J 7	Not assigned		
J 8	Not assigned		
J 9	Not assigned		
J 10	Not assigned		
J 11	Connector,(U-PA2219)	22 pins	
J 12	Not assigned		
J 13	Not assigned		
J 14	Not assigned		
J 15	Not assigned		
J 16	Connector, (HIF23A-26D-AA20S)		
J 17 to J 103	Not assigned		
J 104	Connector, (HIF3-34P-2.54DS)		
J 105	Not assigned		
J 106	Not assigned		
J 107	Not assigned		
J 108	Connector,(U-PA2219)	22 pins	
K 1	Reed relay,(MT03A)		
Q 1	IC,(HN462716)		
Q 2	IC,(HN462716)		
Q 3	IC,(HN6116P-4)		
Q 4	IC,(74LS245)		
Q 5	IC,(μPD780C-1)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF WAVEFORM CONTROL SECTION (OP-01) Z5

CKT REF	DESCRIPTION	RATING	NOTE
Q 6	IC,(74S04)		
Q 7	IC,(74LS244)		
Q 8	IC,(74LS151)		
Q 9	IC,(74LS151)		
Q 10	IC,(7LLS244)		
Q 11	IC,(74LS151)		
Q 12	IC,(74LS00)		
Q 13	IC,(74LS10)		
Q 14	IC,(74LS374)		
Q 15	IC,(74LS374)		
Q 16	IC,(74LS374)		
Q 17	IC,(74LS374)		
Q 18	IC,(74LS244)		
Q 19	IC,(74LS244)		
Q 20	IC,(74LS244)		
Q 21	IC,(74LS244)		
Q 22	IC,(74LS244)		
Q 23	IC,(74LS154)		
Q 24	IC,(74LS32)		
Q 25	IC,(74LS08)		
Q 26	IC,(74LS161A)		
Q 27	IC,(74LS04)		
Q 28	IC,(74LS161A)		
Q 29	IC,(7406)		
Q 30	IC,(74LS161A)		
Q 31	IC,(8291A)		
Q 32	IC,(SN75161)		
Q 33	IC,(74LS240)		
Q 34	IC,(74LS244)		
Q 35	IC,(74LS374)		
Q 36	IC,(74LS161A)		
Q 37	IC,(74LS00)		
Q 38	IC,(74LS74A)		
Q 39	IC,(74LS08)		
Q 40	IC,(74LS32)		
Q 41	IC,(74LS32)		
Q 42	IC,(74LS32)		
Q 43	IC,(74LS74A)		
Q 44	IC,(74LS00)		
Q 45	IC,(74LS123)		
Q 46	IC,(SN75160)		
Q 47	Di,Si,(1S953)		
Q 48	Di,Si,(1S953)		
Q 49	Di,Si,(1S953)		

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING	NOTE
R 1	Single in-line array, (IHR-8-222JA)	2.2kΩ×8,1/8W	
R 2	Single in-line array, (IHR-8-222JA)	2.2kΩ×8,1/8W	
R 3	Single in-line array, (IHR-8-222JA)	2.2kΩ×8,1/8W	
R 4	Single in-line array, (IHR-8-223JA)	22kΩ×8,1/8W	
R 5	Single in-line array, (IHR-8-223JA)	22kΩ×8,1/8W	
R 6	Single in-line array, (IHR-8-222JA)	2.2kΩ×8,1/8W	
R 7	Single in-line array, (IHR-6-222JA)	2.2kΩ×6,1/8W	
R 8	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 9	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 10	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 11	CF,(ARD25T331J)	330Ω,±5%,1/4W	
R 12	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 13	CF,(ARD25T*J)	10k to 220kΩ,±5%, 1/4W	Q'ty 1 to 3,* 10kΩ
R 14	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 15	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 16	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
S 1	Dip,(BP-8)		
S 2	Dip,(BP-8)		
S 3	Dip,(BP-8)		
S 4	Dip,(DIP-A(8))		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF ITS CONTROL SECTION (OP-02) Z5

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Elect,(CE02C1C221)	220µF,±20%,16V	
C 2	Elect,(CE04W1E470)	47µF,±20%,25V	
C 3	Elect,(CE04W1E470)	47µF,±20%,25V	
C 4	Not assigned		
C 5	Cer,(CC924CH1H*J)	12 to 470pF,±5%, 50V	Q'ty 0 to 3,* Open
C 6	Elect,(CE04C1E220)	22µF,±20%,25V	
C 7	Cer,(CC924CH1H221J)	220pF,±5%,50V	
C 8	Tant,(CS02H1V010M)	1µF,±20%,35V	
C 9	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 10	Cer,(CK924C1H223M)	0.022µF,±20%,50V	
C 11	Cer,(CK924C1H222M)	2200pF,±20%,50V	
C 12	Cer,(CC924CH1H220J)	22pF,±5%,50V	
C 13	Cer,(CC924CH1H101J)	100pF,±5%,50V	
C 14	Cer,(CC924CH1H101J)	100pF,±5%,50V	
C 15	Cer,(CC924CH1H331J)	330pF,±5%,50V	
C 16	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 17	Cer,(CK924C1H103M)	0.01µF,±20%,50V	
C 18	Cer,(CK924C1H103M)	0.01µF,±20%,50V	
C 19	Elect,(CE04C1C470)	47µF,±20%,16V	
C 20	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 21	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 22	Cer,(CC924CH1H471J)	470pF,±5%,50V	
C 23	Cer,(CC924CH1H470J)	47pF,±5%,50V	
C 24	Cer,(CC924CH1H470J)	47pF,±5%,50V	
C 25	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 26	Cer,(CK924C1H102M)	1000pF,±20%,50V	
C 27	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 28	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 29	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 30	Cer,(CC924CH1H150J)	15pF,±5%,50V	
C 31	Elect,(CE04C1J100)	10µF,±20%,63V	
C 32	Elect,(CE04W1E470)	47µF,±20%,25V	
C 33	Cer,(CC924CH1H221J)	220pF,±5%,50V	
C 34	Cer,(CC924CH1H101J)	100pF,±5%,50V	
C 35	Cer,(CC924CH1H470J)	47pF,±5%,50V	
C 36	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 37	Elect,(CE04C1E101)	100µF,±20%,25V	
C 38	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 39	Elect,(CE04C1E101)	100µF,±20%,25V	
C 40	Elect,(CE04C1C470)	47µF,±20%,16V	
C 41	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 42	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 43	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 44	Cer,(CK924C1H104M)	0.1µF,±20%,50V	
C 45	Not assigned		

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING	NOTE
C 46	Not assigned		
C 47	Not assigned		
C 48	Not assigned		
C 49	Not assigned		
C 50	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 51	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 52	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 53	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 54	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 55	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 56	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 57	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 58	Elect,(CE04C1E220)	22μF,±20%,25V	
C 59	Elect,(CE04W1A101)	100μF,±20%,10V	
C 60	Cer,(CC924CH1H*J)	15 to 100pF,±5%,50V	Q'ty 0 to 3,* 22pF
C 61	Cer,(CK924C1H*M)	1000pF to 0.1μF, ±20%,50V	Q'ty 0 to 3,* MG311A Open MG311A1 0.047μF, 4700pF Parallel
C 62	Cer,(CC924CH1H*J)	220 to 470pF,±5%, 50V	Q'ty 1 to 3,* 220pF
C 63	Cer,(CC924CH1H*J)	15 to 100pF,±5%,50V	Q'ty 0 to 3,* 22pF
C 64	Elect,(CE04C1J100)	10μF,±20%,63V	
C 65	Elect,(CE04C1J100)	10μF,±20%,63V	
C 66	Tant,(CS-E1VR47M)	0.47μF,±20%,35V	
C 67	Elect,(CE04C1J100)	10μF,±20%,63V	
C 68	Elect,(CE04C1J100)	10μF,±20%,63V	
C 69	Tant,(CS-E1VR47M)	0.47μF,±20%,35V	
C 70	Cer,(CC924CH1H471J)	470pF,±5%,50V	
J 1	Not assigned		
J 2	Not assigned		
J 3	Not assigned		
J 4	Not assigned		
J 5	Not assigned		
J 6	Not assigned		
J 7	Not assigned		
J 8	Not assigned		
J 9	Not assigned		
J 10	Not assigned		

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING	NOTE
J 11	Connector,(U-PA2219)	22 pins	
J 12 to J 51	Not assigned		
J 52	Connector,(PI011-2M)		
J 53	Not assigned		
J 54	Not assigned		
J 55	Connector,(PI011-2M)		
J 56 to J 107	Not assigned		
J 108	Connector,(U-PA2219)	22 pins	
K 1	Relay,(RL-7141-H-138)		
L 1	Microinductor, (LF8-100K)	10μH	
L 2	Microinductor, (LF8-100K)	10μH	
L 3	Microinductor, (LF8-100K)	10μH	
Q 1	Tr,Si,NPN,(2SC1833)		
Q 2	Tr,Si,NPN,(2SC1833)		
Q 3	Tr,Si,NPN,(2SC1833)		
Q 4	Tr,Si,NPN,(2SC1833)		
Q 5	Tr,Si,PNP,(2SA603)		
Q 6	Di,Si,(1S953)		
Q 7	Tr,Si,NPN,(2SC1833)		
Q 8	Tr,Si,NPN,(2SC1833)		
Q 9	IC,(74LS04)		
Q 10	IC,(7426)		
Q 11	IC,(74LS123)		
Q 12	Di,Si,(1S953)		
Q 13	IC,(74LS123)		
Q 14	Tr,Si,NPN,(2SC1216)		
Q 15	Di,Si,(1S2192)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF ITS CONTROL SECTION (OP-02) Z5

CKT REF	DESCRIPTION	RATING	NOTE
Q 16	IC,(μPC258C)		
Q 17	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW	
Q 18	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW	
Q 19	Di,varicap,(FC51)		
Q 20	Di,varicap,(FC51)		
Q 21	J-FET,N ch,(2SK55E)		
Q 22	J-FET,N ch,(2SK55E)		
Q 23	IC,(HD10125)		
Q 24	Di,breakdown,(RD5.1E)	4.8 to 5.7V,400mW	
Q 25	IC,(μPC151C)		
Q 26	IC,(CA3080)		
Q 27	Tr,Si,NPN,(2SC1833)		
Q 28	Tr,Si,NPN,(2SC1833)		
Q 29	Di,Si,(1S953)		
Q 30	Tr,Si,NPN,(2SC1833)		
Q 31	Tr,Si,NPN,(2SC1833)		
Q 32	IC,(74LS123)		
Q 33	Di,Si,(1S953)		
Q 34	Tr,Si,PNP,(2SA603)		
Q 35	IC,(7407)		
Q 36	Tr,Si,NPN,(2SC97)		
Q 37	IC,(CA3140)		
Q 38	Di,Si,(1S953)		
Q 39	Tr,Si,NPN,(2SC943)		
Q 40	Di,Si,(1S953)		
Q 41	Di,Si,(1S953)		
Q 42	IC,(μPC177C)		
Q 43	Tr,Si,NPN,(2SC943)		
Q 44	IC,(CA3140)		
Q 45	Di,Si,(1S953)		
Q 46	Di,Si,(1S953)		
Q 47	Di,Si,(1S953)		
Q 48	Di,Si,(1S953)		
Q 49	Di,Si,(1S953)		
Q 50	IC,(74LS123)		
Q 51	IC,(74LS32)		
Q 52	IC,(74LS148)		
Q 53	IC,(74LS08)		
Q 54	IC,(74LS32)		
Q 55	IC,(74LS04)		
Q 56	IC,(74LS10)		
Q 57	IC,(74LS10)		
Q 58	IC,(74LS00)		
Q 59	IC,(74LS08)		
Q 60	IC,(74LS10)		

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING	NOTE
Q 61	IC,(74LS10)		
Q 62	IC,(74LS00)		
Q 63	IC,(74LS04)		
Q 64	IC,(74LS153)		
Q 65	IC,(74LS148)		
Q 66	IC,(74LS04)		
Q 67	IC,(74LS00)		
Q 68	IC,(74LS04)		
Q 69	IC,(74LS157)		
Q 70	IC,(74LS157)		
Q 71	IC,(74LS151)		
Q 72	IC,(74LS151)		
Q 73	IC,(74LS151)		
Q 74	IC,(74LS151)		
Q 75	IC,(74LS04)		
Q 76	IC,(74LS04)		
Q 77	IC,(74LS293)		
Q 78	IC,(74LS00)		
Q 79	IC,(74LS151)		
Q 80	IC,(74LS04)		
Q 81	IC,(74LS151)		
Q 82	IC,(74LS04)		
Q 83	Not assigned		
R 1	CF,(ARD25T*J)	10k to 120kΩ,±5%, 1/4W	Q'ty 1 to 3,* 12kΩ, 100kΩ Parallel
R 2	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 3	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 4	CF,(ARD25T563J)	56kΩ,±5%,1/4W	
R 5	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W	
R 6	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 7	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 8	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W	
R 9	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W	
R 10	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 11	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W	
R 12	CF,(ARD25T330J)	33Ω,±5%,1/4W	
R 13	CF,(ARD25T224J)	220kΩ,±5%,1/4W	
R 14	CF,(ARD25T153J)	15kΩ,±5%,1/4W	
R 15	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING	NOTE
R 16	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 17	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 18	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 19	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 20	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 21	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 22	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 23	CF,(ARD25T681J)	680Ω,±5%,1/4W	
R 24	CF,(ARD25T223J)	22kΩ,±5%,1/4W	
R 25	CF,(ARD25T393J)	39kΩ,±5%,1/4W	
R 26	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 27	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 28	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 29	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 30	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 31	CF,(ARD25T153J)	15kΩ,±5%,1/4W	
R 32	CF,(ARD25T331J)	330Ω,±5%,1/4W	
R 33	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 34	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 35	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W	
R 36	Var,MF,(RJ-6P 2kΩ)	2kΩ,1/2W	
R 37	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 38	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 39	CF,(ARD25T*J)	15k to 470kΩ,±5%, 1/4W	Q'ty 1 to 3,* 33kΩ
R 40	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 41	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 42	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 43	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 44	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 45	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 46	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 47	CF,(ARD25T*J)	330Ω to 10kΩ,±5%, 1/4W	Q'ty 1 to 3,* 470Ω
R 48	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 49	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 50	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 51	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 52	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 53	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 54	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 55	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 56	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 57	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 58	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 59	CF,(ARD25T330J)	33Ω,±5%,1/4W	
R 60	CF,(ARD25T104J)	100kΩ,±5%,1/4W	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF ITS CONTROL SECTION (OP-02) Z5

CKT REF	DESCRIPTION	RATING	NOTE
R 61	CF,(ARD25T153J)	15kΩ,±5%,1/4W	
R 62	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 63	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 64	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 65	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 66	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 67	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 68	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 69	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 70	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 71	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 72	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 73	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 74	MF,(RS1FB 330ΩJ)	330Ω,±5%,1W	
R 75	Not assigned		
R 76	Not assigned		
R 77	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 78	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 79	CF,(ARD25T221J)	220Ω,±5%,1/4W	
R 80	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 81	CF,(ARD25T*J)	47k to 680kΩ,±5%, 1/4W	Q'ty 1 to 3,* 56kΩ
R 82	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 83	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 84	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 85	CF,(ARD25T*J)	10k to 220kΩ,±5%, 1/4W	Q'ty 1 to 3,* 15kΩ, 180kΩ Parallel
R 86	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 87	CF,(ARD25T473J)	47kΩ,±5%,1/4W	
R 88	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 89	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 90	Single in-line array, (IHR-14-123JA)	12kΩ×14,1/8W	
R 91	Single in-line array, (IHR-14-123JA)	12kΩ×14,1/8W	
R 92	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 93	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 94	CF,(ARD25T331J)	330Ω,±5%,1/4W	
R 95	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 96	CF,(ARD25T123J)	12kΩ,±5%,1/4W	
R 97	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 98	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 99	CF,(ARD25T*J)	33k to 1MΩ,±5%,1/4W	Q'ty 1 to 3,* 47kΩ
R 100	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF ITS CONTROL SECTION (OP-02) Z5

CKT REF	DESCRIPTION	RATING	NOTE
R 101	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W	
R 102	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 103	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 104	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W	
R 105	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 106	CF,(ARD25T333J)	33kΩ,±5%,1/4W	
R 107	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 108	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 109	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 110	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 111	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W	
R 112	CF,(ARD25T*J)	1k to 15kΩ,±5%,1/4W	Q'ty 1 to 3,* 1.5kΩ, 12kΩ Parallel
R 113	CF,(ARD25T560J)	56Ω,±5%,1/4W	
R 114	CF,(ARD25T*J)	47kΩ to 68kΩ,±5%, 1/4W	Q'ty 1 to 3, *56kΩ
S 1	Dip,(BP-8)		
S 2	Dip,(BP-8)		
S 3	Dip,(DIP-A(8))		
S 4	Dip,(DIP-A(8))		
S 5	Dip,(DIP-A(8))		
T 1	Trans,(44L74053)		MG311B/B2 Operation B MG311B1 Operation A

( ): Manufacturer's part number

* : Selected at factory

T F	DESCRIPTION	RATING		NOTE
1	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
2	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
3	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
4	Not assigned			
5	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
6	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
7	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
8	Elect,(CE04W1A470)	47μF,±20%,10V		
9	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
10	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
11	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
12	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
13	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
14	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
15	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
16	Elect,(CE04W1A470)	47μF,±20%,10V		
17	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
18	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
19	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
20	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
21	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
22	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
23	Cer,(CK924C1H*M)	0.001 to 0.1μF,±20%, 50V		Q'ty 1 to 3,*
24	Elect,(CE04W1V4R7)	4.7μF,±20%,35V		
25	Not assigned			
26	Not assigned			
27	Not assigned			
28	Not assigned			
29	Not assigned			
30	Not assigned			
31	Not assigned			
32	Not assigned			
33	Cer,(CC924CH1H471J)	470pF,±5%,50V		
34	Not assigned			
35	Not assigned			
36	Not assigned			
37	Not assigned			
38	Not assigned			
39	Cer,(CC924CH1H471J)	470pF,±5%,50V		
40	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
41	Cer,(CC924CH1H151J)	150pF,±5%,50V		
42	Cer,(CC924CH1H471J)	470pF,±5%,50V		

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING	NOTE
J 1	Not assigned		
J 2	Not assigned		
J 3	Not assigned		
J 4	Not assigned		
J 5	Not assigned		
J 6	Not assigned		
J 7	Not assigned		
J 8	Not assigned		
J 9	Not assigned		
J 10	Not assigned		
J 11	Connector,(U-PA2219)	22 pins	
J 12	Not assigned		
J 13	Not assigned		
J 14	Not assigned		
J 15	Not assigned		
J 16	Connector, (HIF23A-26D-AA20S)		
J 17 to J 51	Not assigned		
J 52	Connector,(PI011-2M)		Q'ty 0 or 1*
J 53	Not assigned		
J 54	Not assigned		
J 55	Connector,(PI011-2M)		Q'ty 0 or 1*
J 56 to J 103	Not assigned		
J 104	Multi connector, , (HIF3-34P-2.54DS)	34 pins	
J 105	Not assigned		
J 106	Not assigned		
J 107	Not assigned		
J 108	Connector,(U-PA2219)	22 pins	
K 1	Relay,(MT03A)		
Q 1	IC,(2716)		
Q 2	IC,(2716)		
Q 3	IC,(HM6116P-4)		
Q 4	IC,(74LS245)		
Q 5	IC,(μPD780C-1)		

( ): Manufacturer's part number

* : Selected at factory

KT EF	DESCRIPTION	RATING	NOTE
6	IC,(74S04)		
7	IC,(74LS244)		
8	IC,(74LS151)		
9	IC,(74LS151)		
10	IC,(74LS244)		
11	IC,(74LS151)		
12	IC,(74LS00)		
13	IC,(74LS10)		
14	IC,(74LS374)		
15	IC,(74LS374)		
16	IC,(74LS374)		
17	IC,(74LS374)		
18	IC,(74LS244)		
19	IC,(74LS244)		
20	IC,(74LS244)		
21	IC,(74LS244)		
22	IC,(74LS244)		
23	IC,(74LS154)		
24	IC,(74LS32)		
25	IC,(74LS08)		
26	IC,(74LS161A)		
27	IC,(74LS04)		
28	IC,(74LS161A)		
29	IC,(7406)		
30	IC,(74LS161A)		
31	IC,(8251A)		
32	IC,(SN75150)		
33	IC,(74LS240)		
34	IC,(74LS244)		
35	IC,(74LS374)		
36	IC,(74LS161A)		
37	IC,(74LS00)		
38	IC,(74LS74A)		
39	IC,(74LS08)		
40	IC,(74LS32)		
41	IC,(74LS32)		
42	IC,(74LS32)		
43	IC,(74LS74A)		
44	IC,(74LS00)		
45	IC,(74LS123)		
46	IC,(SN75154)		
47	Di,Si,(1S953)		
48	Di,Si,(1S953)		
49	Di,Si,(1S953)		
50	Di,Si,(1S953)		

( ): Manufacturer's part number

* : Selected at factory

CKT REF	DESCRIPTION	RATING		NOTE
Q 51	Di,Si,(1S953)			
Q 52	Di,Si,(1S953)			
Q 53	Di,Si,(1S953)			
Q 54	IC,(SN75150)			
Q 55	IC,(SN75154)			
Q 56	IC,(COM8146)			
Q 57	IC,(74LS244)			
R 1	Single-in line array, (IHR-8-222JA)	2.2kΩ×8,1/8W		
R 2	Single-in line array, (IHR-8-222JA)	2.2kΩ×8,1/8W		
R 3	Single-in line array, (IHR-8-222JA)	2.2kΩ×8,1/8W		
R 4	Single-in line array, (IHR-8-223JA)	22kΩ×8,1/8W		
R 5	Single-in line array, (IHR-8-222JA)	22kΩ×8,1/8W		
R 6	Single-in line array, (IHR-8-222JA)	2.2kΩ×8,1/8W		
R 7	Single-in line array, (IHR-6-222JA)	2.2kΩ×6,1/8W		
R 8	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 9	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 10	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 11	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 12	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 13	CF,(ARD25T*J)	10k to 220kΩ,±5%, 1/4W		Q'ty 1 to 3,*
R 14	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 15	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R 16	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 17	Single-in line array, (IHR-8-222JA)	2.2kΩ×8,1/8W		
S 1	Dip,(BP-8)			
S 2	Dip,(BP-8)			
S 3	Dip,(BP-8)			
S 4	Dip,(DIP-A(8))			
S 5	Dip,(DIP-A(8))			

( ) : Manufacturer's part number

* : Selected at factory

KT EF	DESCRIPTION	RATING		NOTE
1	XTAL OSC,(34X73400)	5.0688MHz		

( ): Manufacturer's part number

* : Selected at factory

REF	DESCRIPTION	RATING	NOTE
1	Not assigned		
2	Connector,(U-SA2201)	22 pins	
3	Not assigned		
4	Connector,(U-SA2201)	22 pins	
5	Not assigned		
6	Connector,(U-SA2201)	22 pins	
7	Not assigned		
8	Connector,(U-SA2201)	22 pins	
9	Not assigned		
10	Connector,(U-SA2201)	22 pins	
11	Not assigned		
12	Connector,(U-SA2201)	22 pins	
13	Connector,(U-PB1519)	15 pins	
14	Not assigned		
15	Connector, (HIF3-26P-2.54DS)	26 pins	
16	Not assigned		
17	Connector,(U-PB1521)	15 pins	
18	Not assigned		
19	Connector,(U-PB2221)	22 pins	
20	Not assigned		
21	Connector,(U-PB2221)	22 pins	
22	Not assigned		
23	Connector,(U-PB2221)	22 pins	
24	Not assigned		
25	Not assigned		
26	Connector,(U-SA2201)	22 pins	
27	Not assigned		
28	Connector,(U-SA1501)	15 pins	
29 to 95	Not assigned		
96	Connector, (HIF3-16P-2.54DSA)	16 pins	
97	Not assigned		
98	Not assigned		
99	Not assigned		
100	Connector,(U-SA2201)	22 pins	
101	Not assigned		
102	Not assigned		
103	Not assigned		
104	Not assigned		
105	Not assigned		
106	Not assigned		
107	Not assigned		
108	Not assigned		
109	Connector,(U-SA2201)	22 pins	

( ): Manufacturer s part number

* : Selected at factory

COMPONENT LIST OF MOTHERBOARD 2 Z7

CKT REF	DESCRIPTION	RATING	NOTE
J 1 to J 36	Not assigned		
J 37	Connector, (252-22-50-169)		
J 38	Connector, (252-22-50-169)		
J 39	Connector, (252-22-50-169)		
J 40	Connector, (252-22-50-169)		
J 41 to J 78	Not assigned		
J 79	Connector,(U-PB1521)	15 pins	
J 80	Not assigned		
J 81	Connector,(U-PB2221)	22 pins	
J 82	Not assigned		
J 83	Connector,(U-PB2221)	22 pins	
J 84	Not assigned		
J 85	Connector,(U-PB2221)	22 pins	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF MOTHERBOARD 3 Z8

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V	
C 2	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V	
J 1 to J 24	Not assigned		
J 25	Connector,(U-PA2219)	22 pins	
J 26	Not assigned		
J 27	Connector,(U-PA1519)	15 pins	
J 28	Not assigned		
J 29	Not assigned		
J 30	Connector,(U-SA2201)	22 pins	
J 31	Not assigned		
J 32	Connector,(U-SA2201)	22 pins	
J 33	Connector,(U-PB2219)	22 pins	
R 1	CF,(ARD25T*J)	680Ω to 10kΩ,±5%, 1/4W	Q'ty 1 to 3,* 820Ω, 8.2kΩ Parallel
R 2	CF,(ARD25T561J)	560Ω,±5%,1/4W	
R 3	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 4	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W	
R 5	Var,MF,(RG161P15SB 1kΩM)	1kΩ	
R 6	Var,MF,(RG161P15SB 1kΩM)	1kΩ	
R 7	Var,MF,(RG161P15SB 1kΩM)	1kΩ	
R 8	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W	
R 9	CF,(ARD25T*J)	2.2k to 15kΩ,±5%, 1/4W	Q'ty 1 to 3,* 2.7kΩ, 12kΩ Parallel

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF POWER SOURCE Z9

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Elect,(CE02W1J221)	220μF,±20%,63V	
C 2	Elect,(CE02W1V222)	2200μF,±20%,35V	
C 3	Elect,(CE02W1V222)	2200μF,±20%,35V	
C 4	Elect,(CE02W1C103)	10000μF,±20%,16V	
C 5	Elect,(CE02W1V472)	4700μF,±20%,35V	
C 6	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 7	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 8	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 9	Cer,(CK924C1H104M)	0.1μF,±20%,50V	
C 10	Elect,(CE04W1E470)	47μF,±20%,25V	
C 11	Elect,(CE04W1E470)	47μF,±20%,25V	
C 12	Elect,(CE04W1E470)	47μF,±20%,25V	
C 13	Elect,(CE04W1E470)	47μF,±20%,25V	
C 14	Elect,(CE04W1E470)	47μF,±20%,25V	
C 15	Elect,(CE04W1E470)	47μF,±20%,25V	
C 16	Elect,(CE04W1E470)	47μF,±20%,25V	
C 17	Elect,(CE04W1E101)	100μF,±20%,25V	
C 18	Elect,(CE04W1E221)	220μF,±20%,25V	
C 19	Elect,(CE04W1E101)	100μF,±20%,25V	
C 20	Elect,(CE04W1E221)	220μF,±20%,25V	
C 21	Elect,(CE04W1E221)	220μF,±20%,25V	
C 22	Elect,(CE02W1C222)	2200μF,±20%,16V	
C 23	Elect,(CE02W1C222)	2200μF,±20%,16V	
C 24	Elect,(CE04W1E470)	47μF,±20%,25V	
C 25	Elect,(CE04W1E470)	47μF,±20%,25V	
C 26	Elect,(CE04W1E470)	47μF,±20%,25V	
J 1 to J 34	Not assigned		
J 35	Connector,(U-PB1521)	15 pins	
J 36 to J 76	Not assigned		
J 77	Connector,(PI011-5M)		
J 78 to J 106	Not assigned		
J 107	Connector,(PI011-12M)		
M 1	Timer,(TM-O)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF POWER SOURCE Z9

CKT REF	DESCRIPTION	RATING	NOTE
Q 1	Di,bridge,(RB-152-LFB)		
Q 2	Di,bridge,(M4C-31-12)		
Q 3	Di,bridge,(M4C-6)		
Q 4	Di,bridge,(M4C-6)		
Q 5	IC,(μPC14324H)		
Q 6	IC,(LM317T)		
Q 7	IC,(μPC16312H)		
Q 8	IC,(μPC14312H)		
Q 9	IC,(μPC14312H)		
Q 10	IC,(7407)		
Q 11	IC,(7407)		
Q 12	IC,(μPC16312H)		
R 1	MF,(RN14K2E1210D)	120Ω,±0.5%,1/4W	
R 2	MF,(RN14K2E1821D)	1.82kΩ,±0.5%,1/4W	
R 3	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 4	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 5	CF,(ARD25T105J)	1MΩ,±5%,1/4W	
R 6	CF,(ARD25T220J)	22Ω,±5%,1/4W	
R 7	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 8	MF,(RN14K2H221J)	220Ω,±5%,1/2W	
R 9	MF,(RN14K2H221J)	220Ω,±5%,1/2W	
R 10	MF,(RN14K2H221J)	220Ω,±5%,1/2W	
R 11	CF,(ARD25T471J)	470Ω,±5%,1/4W	
R 12	CF,(ARD25T181J)	180Ω,±5%,1/4W	
R 13	CF,(ARD25T181J)	180Ω,±5%,1/4W	
R 14	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 15	CF,(ARD25T820J)	82Ω,±5%,1/4W	
R 16	CF,(ARD25T121J)	120Ω,±5%,1/4W	

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF SWITCH BOARD Z10

CKT REF	DESCRIPTION	RATING	NOTE
C 1	Elect,(CE04W1E101)	100µF,±20%,25V	
J 1 to J 86	Not assigned		
J 87	Connector,(U-PB2221)	22 pins	
R 1	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 2	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 3	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
S 1	Not assigned		
S 2	Pushbutton,(44S68793)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF CONNECTOR BOARD (OP-01) Z11

CKT REF	DESCRIPTION	RATING	NOTE
J 1 to J 102	Not assigned		
J 103	Connector, (57L-20240-27CD35)		
J 104	Not assigned		
J 105	Connector, (HIF23A-34D-AA15S)		
S 1	Dip,(BP-8)		
S 2	Dip,(BP-8)		

( ): Manufacturer's part number

* : Selected at factory

COMPONENT LIST OF CONNECTION BOARD (UP-03) 215

KT EF	DESCRIPTION	RATING		NOTE
1 to 102	Not assigned			
103	Connector, (RDBB-25S-LN)			
104	Not assigned			
05	Connector, (HIF23A-34D-AA20S)	34 pins		
1	Switch, (BP-8)			
2	Switch, (BP-8)			

( ): Manufacturer's part number

* : Selected at factory

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